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ABSTRACT

Information on the employment status of recent science, engineering, and humanities doctorate recipients is presented, with special emphasis on the 1973-1976 graduates. The primary data source is the 1981 Survey of Doctorate Recipients, which is appended. Attention is directed to the increasing number of Ph.D.s awarded over the last decade or two, especially to women and minority groups. For 1973-1976 Ph.D.s, the analysis covers variables such as employment status, field mobility, type of employers, tenure status, and academic position. Comparisons are made by field, sex, postgraduation plans, and employment setting, and with other Ph.D. year cohorts. Findings for science and engineering Ph.D.s include: almost two-thirds of the 1960-1964 graduates had firm commitments for employment immediately after receiving their doctorates, compared to only half of the 1977-1980 graduates; and there has been an increasing movement into nonacademic employment for recent science and engineering doctorate recipients. Findings for humanities Ph.D.s include the following: for 1973-1976 graduates, a larger percentage of women were part-time employed in 1981 than were men; and except for the fields of art history and music, a maximum of one-third of the graduates were working in nonacademic jobs. (SW)

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Departing the Ivy Halls

Changing Employment Situations for Recent Ph.D.s

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Survey of Doctorate Recipients

Office of Scientific and Engineering Personnel

National Research Council

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Departing the Ivy Halls

Changing Employment Situations for Recent Ph.D.s

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Survey of Doctorate Recipients
Office of Scientific and Engineering Personnel
National Research Council

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ACKNOWLEDGMENTS

This report focuses on the employment status of recent science, engineering, and humanities doctorate recipients, with special emphasis on the 1973-1976 graduates. The report is based primarily on data from the Survey of Doctorate Recipients (SDR) but also includes data from the annual Survey of Earned Doctorates.

The SDR is conducted under the auspices of the Office of Scientific and Engineering Personnel (OSEP) of the National Research Council. Support for the project was provided by the National Science Foundation and the National Endowment for the Humanities.

Susan Henn, SDR Staff Associate, was responsible for compiling the summary statistics in the report and in consultation with Deborah Gangloff, consultant to the project, produced the initial outline and draft of the report. The final report was edited by Betty Maxfield and typed by Olivia Waller.

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To these individuals and all others who aided in the preparation of the report and to the scientists, engineers, and humanists who responded to the Survey we are most appreciative.

Betty D. Maxfield
Director
Survey of Doctorate Recipients

PREFACE

Ph.D.s[1] in the sciences, engineering, and the humanities have traditionally sought and secured employment in academe. However, during the past 10 years, the academic job market has tightened considerably because of both the greater number of qualified applicants available for academic positions and changes in students' preferences for study. Thus, the more recent and less experienced doctorate recipients are facing a new employment situation in that they are experiencing greater difficulty in both obtaining and retaining academic positions. As a result, there has been a marked change in the role of postdoctoral appointments and a shift in employment from academe to government and business settings among these more recent Ph.D.s.

These trends are worthy of further examination because of their possible effects on the early career patterns of Ph.D.s. Furthermore, academe is experiencing changes that could have far-reaching effects on the direction and quality of research and teaching. Field mobility may also be on the increase because of the differences in employment opportunities among fields and the economic constraints confronting Ph.D. recipients.

The purpose of this report is to provide a greater understanding of the current career paths of recent Ph.D.s. The report focuses primarily on the employment status of the 1973-1976 science, engineering, and humanities Ph.D.s. These Ph.D.s were selected for the study because we believe that 5-8 years after receiving their doctoral degree, individuals are in the process of making some major career decisions--e.g., teaching versus management, tenure-track versus nontenure-track, academic versus nonacademic employment, job in Ph.D. field or job in a related but different field. In addition, individuals who earned their Ph.D.s during the 1973-1976 period have been in the sample of the 1977, 1979, and 1981 Surveys of Doctorate Recipients.

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[1]The term Ph.D. is used in this report to include equivalent third-level research degrees such as D.Sc., Eng.D., D.M.A., and D.A., but excludes such professional degrees as M.D., D.D.S., D.V.M., and J.D.

Data Sources

The primary data source for this study is the 1981 Survey of Doctorate Recipients (SDR).[2] The 1981 survey is the fifth biennial survey conducted by the National Research Council under the sponsorship of the National Science Foundation, the National Endowment for the Humanities, the National Institutes of Health, and the Department of Energy. The SDR has been in existence since 1973; in 1977, humanities Ph.D.s were added to the existing sample of doctoral scientists and engineers.[3] Data from the 1975, 1977, and 1979 SDRs are used in the report to analyze employment trends of Ph.D.s 5-8 years after the doctorate.

A secondary data source used in this report is the Doctorate Records File's Survey of Earned Doctorates (SED).[4] The significant information used from this source concerns individuals' career plans at the time they received their doctoral degrees.

Limitations of the Data

The estimates presented in this report are subject to nonsampling and sampling errors. Nonsampling errors may arise from such sources as misinterpretation of questions by respondents, errors in coding and processing the responses, and bias from failure to respond to the survey.

Sampling error, or standard error, is a measure of the precision with which an estimate based on the survey sample approximates the average result of all possible samples of equal size conducted under the same conditions. The size of the sampling error is directly related to the number of responses received from the sampled group.[5]

In some cases, the number of responses is too small to support estimates of individuals in certain degrees and/or degree years. In these cases, survey results have been merged into aggregated categories.

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[2]See Appendix A for a copy of the 1981 Survey of Doctorate Recipients questionnaire.

[3]See Appendix B for an explanation of the SDR sample.

[4]The Doctorate Records File (DRF) is based on the NRC's annual Survey of Earned Doctorates, an ongoing compilation of information taken from the questionnaires completed by all new Ph.D. recipients in U.S. universities. The DRF presently includes data on the 693,000 doctorate recipients of the past 62 years, although the survey itself did not begin until 1957.

[5]Procedures used in calculating standard error in SDR publications are described in Science, Engineering, and Humanities Doctorates in the United States: 1981 Profile, Appendix E.

Organization of the Report

This report is divided into two chapters. Chapter I focuses on the science and engineering Ph.D.s; Chapter II on the humanities Ph.D.s. The science and engineering fields include mathematics, computer sciences, physics/astronomy, chemistry, earth/environmental sciences, engineering, agricultural sciences, medical sciences, biological sciences, pschology, and the social sciences. The humanities fields include art history, history (American, European, other, American studies), speech/theater, music, philosophy, other humanities (library/archival sciences, general, other), English and American languages and literature, classical languages and literature, and other Modern languages and literature (including comparative literature). A complete list of the fine fields included under each broad field is shown in the Degree and Employment Specialties List in Appendix A.

Each chapter begins by focusing on the increasing number of Ph.D.s awarded over the last decade or two, especially to women and members of racial/ethnic minority groups, and on shifting postgraduation plans during the past 20 years. Special emphasis is then given to the 1973-1976 Ph.D.s: variables such as employment status, field mobility, type of employer, tenure status, and academic position are analyzed. Comparisons are made by field, sex, postgraduation plans, and employment setting and with other Ph.D. year cohorts.

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SUMMARY

Many factors have contributed to the situation faced by recent Ph.D.s attempting to enter and advance in today's employment market. Ph.D. production has approximately doubled with each decade, thus resulting in multiple applications for positions that have traditionally been filled by doctorate recipients. Furthermore, during the 1970s, the number of both women and racial/ethnic minorities earning doctorates has increased at a rapid rate.

On the whole, the percentage of Ph.D.s obtaining academic employment has decreased in the last 20 years. The lack of employment opportunities in academe has, however, been somewhat compensated by the availability of postdoctoral appointments and jobs in the private sector, primarily in business/industry and government.

Within the academic system, the attainment of advanced rank and tenure has been affected by projections of declining student enrollments and the increased numbers of Ph.D.s available for academic positions. Recent Ph.D.s are increasingly being employed in off-ladder nontenure-track positions.

In general, the employment situation for new Ph.D.s is brightened by the growth of nonacademic opportunities, but the new Ph.D.s need to be able to compete successfully with other more experienced candidates for private sector jobs in today's and tomorrow's ever changing labor market sector. The fields of study selected by graduate students have certainly been influenced by the availability of employment opportunities in those fields, as well as by research funding in both academe and the private sector. The postgraduation plans for Ph.D.s have also changed dramatically over the last two decades. There has been a substantial increase in the percentages of Ph.D.s who are still seeking employment or planning postdoctoral study immediately after receipt of the doctoral degree.

Some of the findings of this report are as follows:

Science and Engineering Ph.D.

- The number of individuals with doctoral degrees in science and engineering has been vastly increased by the production of the 1970s. In fact, almost as many scientists and engineers earned their doctoral degrees from 1977 to 1980 as had done so between 1938 and 1959. (Table 1.1)

- Although male science and engineering Ph.D.s outnumber females, the number of women earning doctoral degrees in science and engineering has increased at a rapid rate. In contrast, the production of male science and engineering doctorates, after steady increases through the 1960s, has decreased slightly during the 1970s. (Table 1.2)

- Overall, the number (25,700) of racial/ethnic minority group members who earned science and engineering Ph.D.s between 1970 and 1980 was more than double that of the 1960s (10,300). These minority scientists and engineers are predominantly Asians/Pacific Islanders (70 percent of the 1981 science and engineering minority Ph.D. population). (Table 1.3)

- The percentage of new science and engineering Ph.D.s with definite postgraduation plans for employment has declined over the past 20 years: almost two-thirds of the 1960-1964 graduates had firm commitments for employment immediately after receiving their doctorates compared to only half of the 1977-1980 graduates. (Table 1.4)

- New Ph.D.s in the life sciences are increasingly selecting postdoctoral study rather than employment following receipt of their doctorates: as many as 47 percent of the 1977-1980 graduates had definite postgraduation plans for additional study compared to 21 percent of the 1960-1964 graduates. In contrast, Ph.D.s in the behavioral and social sciences had fewer postgraduation options open to them: 84 percent of the 1973-1976 graduates were either seeking employment or committed to a job immediately after receipt of their doctorates. (Table 1.4)

- The difficult employment situation confronting Ph.D.s in the biological sciences is demonstrated by the fact that as many as 6 percent of the 1973-1976 Ph.D.s in that field held postdoctoral appointments 5-8 years after receiving their doctorates. (Table 1.5)

- Ph.D.s with degrees in physics/astronomy and mathematics had the highest incidence of field mobility among scientists and engineers: as few as 60 percent and 66 percent, respectively, of the 1973-1976 graduates in those fields were working in jobs in their doctoral specialty area in 1981. (Table 1.8)

- There has been an increasing movement into nonacademic employment for recent science and engineering doctorate recipients. Ph.D.s in the EMP fields (engineering, mathematics, computer sciences, and the physical sciences) have shown the largest shift into business and industry: 53 percent of the 1977-1980 graduates were working in business/industry in 1981 compared to 35 percent of the 1960-1964 graduates. (Table 1.12)

- Among academically employed 1973-1976 science and engineering Ph.D.s, 59 percent of those who had firm job commitments immediately after receiving their doctorate- as compared to only 32 percent of those who were still seeking employment and 16 percent of those who delayed entering tenure-track by planning postdoctoral study--were tenured in 1981. (Table 1.21)

- Ph.D.s in the life sciences lag about one year behind other science and engineering fields in promotions to associate professor. (Table 1.26) This may be tied to the increasing trend among life scientists to pursue postdoctoral study rather than employment immediately after receiving their doctorates.

- Only 22 percent of the academically employed 1973-1976 science and engineering Ph.D.s with definite postdoctoral study plans at graduation held the rank of full or associate professor in 1981, compared to over 60 percent of those with firm commitments for immediate employment after receiving their doctorates. (Table 1.27)

- Overall, the percentage of academically employed science and engineering Ph.D.s holding the rank of full or associate professor 5-8 years after receipt of their doctoral degrees has decreased since 1975: 62 percent of the 1967-1971 graduates held such ranks in 1975 compared to only 48 percent of the 1973-1976 graduates in 1981. (Table 1.28)

Humanities Ph.D.s

- Although 57 percent of the 76,000 humanities doctorate recipients in the United States earned their doctoral degrees between 1970 and 1980, the production of humanities doctorates has declined during the 1970s. (Table 2.1)

- Slightly over half (53 percent) of the male humanities Ph.D.s earned their degrees between 1970 and 1980, compared to as many as 70 percent of the women. (Table 2.2)

- The percentage of humanities Ph.D.s with firm job commitments when they graduated has shown a substantial decline over the past 15 years: 87 percent of the 1965-1969 graduates had definite job commitments when they graduated compared to only 59 percent of the 1977-1980 graduates. (Table 2.4)

- For 1973-1976 humanities Ph.D.s, a larger percentage of women were part-time employed in 1981 than were men (12 percent and 4 percent, respectively). In addition, another 9 percent of the women were not employed in 1981 compared to 3 percent of the men. (Table 2.5)

- Only 57 percent of the employed 1973-1976 history Ph.D.s were working in their doctoral specialty area in 1981. (Table 2.8)

- Except for the fields of art history and music, a maximum of one-third of the 1973-1976 humanities Ph.D.s working in nonacademic jobs (i.e., employment other than 2-year colleges, 4-year colleges, or universities) were able to secure employment in their doctoral fields while at least three-fourths of the academically employed humanities Ph.D.s held positions in their doctoral fields. (Table 2.9)

- Among those employed full-time or part-time in 1981, almost 90 percent of the 1960-1964 humanities Ph.D.s held jobs at 4-year colleges or universities compared to 68 percent of the 1977-1980 graduates. (Table 2.12)

- As many as 26 percent of the academically employed 1977-1980 humanities Ph.D.s held nontenure-track positions in 1981 compared to 4 percent of the 1960-1964 graduates. (Table 2.15)

- Among 1973-1976 humanities Ph.D.s employed full-time at universities, women were almost twice as likely as men to hold nontenure track positions (15 percent of women compared to 8 percent of men). (Table 2.18)

- The percentage of academically employed humanities Ph.D.s who held a tenured position 5-8 years after receipt of the doctorate degree has decreased during the past four years: 67 percent of the 1969-1972 academically employed Ph.D.s were tenured in 1977 compared to 58 percent of the 1973-1976 group in 1981. (Table 2.19)

- More than three-fourths of the 1973-1976 humanities Ph.D.s known to be academically employed in both 1977 and 1981 were employed at the same institution in both years. Approximately 72 percent of those Ph.D.s were tenured in 1981 compared to only 25 percent of those who switched institutions between 1977 and 1981. (Table 2.20)

- Among 1973-1976 humanities Ph.D.s academically employed in 1981, as many as 27 percent of those who were seeking employment immediately after receiving their doctoral degrees held nontenure-track positions in 1981 compared to less than 10 percent of those who had definite postgraduation job plans. (Table 2.21)

- For humanities Ph.D.s who were employed in academe in 1981, the percentage who held off-ladder positions (i.e., instructorships, other nonprofessorial faculty, and nonfaculty) is larger among the more recent Ph.D. recipients: for 1977-1980 graduates, 20 percent held such positions compared to 5 percent of the 1960-1964 graduates. (Table 2.22)

- Overall, the percentage of academically employed humanities Ph.D.s holding the rank of full or associate professor 5-8 years after receipt of their doctorates has slightly decreased since 1977: 61 percent of the 1969-1972 graduates held such ranks in 1977 compared to only 54 percent of the 1973-1976 graduates in 1981. (Table 2.24)

Chapter I

Science and Engineering

1981 DOCTORAL POPULATION

Of the estimated 358,600 science and engineering Ph.D.s residing in the United States in 1981, nearly 52 percent earned their doctoral degrees between 1970 and 1980. Table 1.1 shows that the production of science and engineering Ph.D.s has approximately doubled from decade to decade during the past 30 years. In fact, almost as many doctoral scientists and engineers earned their doctoral degrees during the most recent 4-year period, 1977-1980, as had done so between 1938 and 1959. Overall, however, the Ph.D. production rate for scientists and engineers appears to have slightly decreased during the 1970s.

TABLE 1.1 Science and Engineering Ph.D.s in the United States in 1981 by Field and Year of Doctorate

Field of Doctorate	Total 1938-1980	Year of Doctorate 1938-1949	1950-1959	1960-1969	1970-1980	1973-1976	1977-1980
	N	%	%	%	%	%	%
All Fields	358,600	5.7	14.3	28.2	51.8	18.7	18.1
Mathematics	19,000	6.2	10.6	32.5	50.7	17.8	14.9
Computer Sciences	2,200	0.0	0.6	4.3	95.1	33.4	42.0
Physics/Astronomy	29,300	5.5	16.6	33.4	44.6	15.8	13.2
Chemistry	48,000	11.5	19.4	30.7	38.4	13.6	12.0
Earth/Envir. Sci	12,400	6.0	10.8	28.2	55.0	18.5	21.7
Engineering	52,900	3.4	11.8	33.3	51.6	19.2	14.5
Agricultural Sci	16,500	6.0	20.2	27.9	45.9	16.4	15.2
Medical Sciences	11,100	4.7	10.8	26.1	58.4	20.3	23.8
Biological Sci	64,800	6.7	15.3	26.5	51.5	18.5	18.9
Psychology	47,400	2.8	13.5	24.2	59.5	21.3	24.9
Social Sciences	55,100	4.6	12.0	23.8	59.6	22.3	22.1

SOURCE: National Research Council.

Field of Ph.D.

The relatively new doctoral field of computer sciences has shown the largest growth rate in the last decade. An estimated 95 percent of the doctorate recipients in computer sciences in the United States in 1981 had earned their doctorates between 1970 and 1980, and almost half of these Ph.D.s did so during the last four years (1977-1980). Other science and engineering fields that have demonstrated high rates of growth since the 1960s include the social sciences, psychology, and the medical sciences--nearly 60 percent of the individuals in each of these fields had earned their doctorates between 1970 and 1980. On the other hand, the fields of chemistry and physics/astronomy have shown the least amount of growth since the 1960s--only 38 percent of the chemistry Ph.D.s and 45 percent of the physics/astronomy Ph.D.s in the United States in 1981 had earned their doctoral degrees between 1970 and 1980.

Sex

Table 1.2 points out the changing situation in the number of science and engineering Ph.D.s granted to women. Although male Ph.D.s still outnumber females, the number of women earning doctoral degrees in science and engineering fields is still increasing at a rapid rate, while the number of men appears to have decreased slightly during the 1970s.

Only 7 percent (3,300) of the female science and engineering Ph.D.s in the United States in 1981 had earned their doctoral degrees during the 1950s. That percentage more than doubled in the 1960s when 19 percent (8,600) of the female science and engineering Ph.D. population earned their doctoral degrees. In fact, approximately 69 percent (30,700) of the female doctoral scientists and engineers had earned their doctorates just during the last 11 years (1970-1980), an increase almost triple the percentage of degrees earned by females in either of the previous two decades. The upward trend in the number of science and engineering doctoral degrees awarded to women appears to be continuing into the present. It should be noted, however, that more than three-fourths of the doctoral degrees awarded to women are in the fields of psychology, the biological sciences, and the social sciences.

For male science and engineering Ph.D.s, the percentage earning their doctorates during the 1960s (30 percent) was double the percentage of 1950-1959 graduates (15 percent). Between 1970 and 1980, the number of science and engineering doctorates awarded to men decreased slightly, although it was still larger than for past decades (49 percent of the total number of science and engineering held by men in the United States in 1981).

TABLE 1.2 Science and Engineering Ph.D.s in the United States in 1981 by Sex, Field, and Year of Doctorate

Sex and Field of Doctorate	Total	Year of Doctorate 1938-1949	1950-1959	1960-1969	1970-1980	1973-1976	1977-1980
	N	%	%	%	%	%	%
Men, All Fields	314,000	5.9	15.3	29.5	49.4	17.9	16.2
Mathematics	17,400	6.2	11.1	33.2	49.5	17.4	13.9
Computer Sciences	2,000	0.0	0.6	4.4	95.0	33.2	41.1
Physics/Astronomy	28,400	5.4	16.8	33.7	44.0	15.6	12.8
Chemistry	44,500	11.8	20.1	31.0	37.0	13.2	11.1
Earth/Envir. Sci	11,800	6.0	11.0	29.0	54.0	18.1	20.9
Engineering	52,300	3.4	11.8	33.5	51.2	19.0	14.2
Agricultural Sci	16,000	6.0	20.6	28.5	44.9	16.4	14.1
Medical Sciences	9,200	5.2	11.6	28.5	54.7	19.3	20.2
Biological Sci	52,500	6.8	16.7	27.7	48.9	17.5	17.1
Psychology	34,400	2.7	16.3	26.3	54.8	20.2	20.8
Social Sciences	45,700	4.7	13.4	25.5	56.4	21.0	19.7
Women, All Fields	44,600	4.7	7.3	19.2	68.8	24.3	31.7
Mathematics	1,600	6.4	5.6	24.5	63.5	22.9	25.6
Computer Sciences	200	0.0	0.0	3.4	96.6	34.8	52.2
Physics/Astronomy	900	6.2	11.2	21.5	61.1	22.1	23.7
Chemistry	3,500	6.8	11.2	25.8	56.1	19.0	22.9
Earth/Envir. Sci	600	5.0	8.2	12.9	74.0	26.0	37.9
Engineering	500	1.0	4.6	11.0	83.4	32.2	41.2
Agricultural Sci	500	3.9	8.5	12.0	75.6	16.7	47.4
Medical Sciences	1,900	2.0	6.8	14.7	76.5	25.2	40.8
Biological Sci	12,300	6.3	9.5	21.8	62.4	22.7	26.6
Psychology	13,100	3.3	5.9	18.7	72.1	23.9	35.9
Social Sciences	9,400	4.0	5.2	15.5	75.3	20.8	33.8

SOURCE: National Research Council.

Racial/Ethnic Group

In 1981, approximately 11 percent (39,300) of the science and engineering doctoral population was made up of individuals who classified themselves as members of racial/ethnic minority groups: Blacks, American Indians/Alaskan Natives, Hispanics, or Asians/Pacific Islanders (Table 1.3).

Compared with past decades, the number of racial/ethnic minority group members receiving doctoral degrees in science and engineering increased dramatically during the 1970s.[6] Almost two-thirds of the 39,300 minority group members with science and engineering Ph.D.s in the United States in 1981 had earned their doctorates between 1970 and 1980 compared to approximately one-half of the non-minority science and engineering Ph.D.s. Overall, the number of minority group members who earned science and engineering Ph.D.s between 1970 and 1980 was more than double that of the 1960s.

It should be noted that of the estimated 25,700 science and engineering Ph.D.s earned by minorities during the 1970s, 18,100 were awarded to Asians.

Postgraduation Plans

The postgraduation plans of science and engineering Ph.D.s at the time their doctoral degrees were awarded have varied over time. The expectations and plans of new Ph.D.s, and their subsequent actions, have been influenced by the availability of research and employment opportunities in academe and in the private sector. In general, the percentage of science and engineering Ph.D.s who had firm plans for a postdoctoral study appointment at the time they earned their degrees has increased during the past 20 years.

Projections of declining student enrollments and the general economic climate have made academic employment somewhat difficult to obtain and to retain. Ph.D.s are finding diversified employment opportunities in other employment sectors such as business/industry and government.

Ph.D.s who earned their doctorates between 1973 and 1976 have made or are currently making career decisions in an employment market that differs markedly from that of previous Ph.D. graduates. The incidence of employment in the traditional academic world is considerably lower now, while nonacademic employment has increased.

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[6] For a detailed analysis see Employment of Minority Ph.D.s: Changes Over Time, National Research Council, National Academy Press, Washington, D.C., 1981.

TABLE 1.3 Science and Engineering Ph.D.s in the United States in 1981 by Year of Doctorate and Race/Ethnic Identification

Racial/Ethnic Group		Total 1938-1980	Year of Doctorate 1938-1949	1950-1959	1960-1969	1970-1980	1973-1976	1977-1980
Total, All Groups	N	358,600	20,500	51,300	101,100	185,700	67,000	65,100
	%	100.0	5.7	14.3	28.2	51.8	18.7	18.1
White	N	313,800	19,200	47,900	88,800	157,600	56,200	54,900
	%	100.0	6.2	15.2	28.3	50.2	17.9	17.5
Minorities Total	N	39,300	600	2,700	10,300	25,700	10,000	9,700
	%	100.0	1.5	6.8	26.2	65.6	25.5	24.8
Hispanic	N	4,900	100	400	1,100	3,300	1,400	1,200
	%	100.0	2.2	7.8	23.4	66.6	28.3	25.0
Black	N	4,500	100	500	700	3,200	1,400	1,300
	%	100.0	2.9	9.8	16.4	70.8	30.9	29.0
Asian/Pacific Islander	N	27,700	300	1,500	7,800	18,100	6,800	6,900
	%	100.0	0.9	5.5	28.1	65.5	24.8	24.9
Amer Indian/ Alk Native	N	2,200	100	300	600	1,200	400	300
	%	100.0	3.2	14.5	28.4	54.0	16.8	14.0
No Report	N	5,500	400	700	2,000	2,400	800	500
	%	100.0	7.0	13.0	36.8	43.2	13.9	8.7

Note: Vertical and horizontal numbers for minority groups may not always add up to total figure because of rounding.

SOURCE: National Research Council.

Approximately one out of every five 1973-1976 science and engineering Ph.D.s made a definite commitment to do additional study immediately following the receipt of his/her degree. Selecting postdoctoral study rather than employment after receipt of the doctorate is a trend that has increased during the past 20 years for new science and engineering Ph.D.s (Table 1.4). By comparison, only 12 percent of the 1960-1964 graduates and 14 percent of the 1965-1968 graduates had definite plans for postdoctoral study immediately after Ph.D. receipt, compared to as many as 24 percent of the 1977-1980 science and engineering Ph.D.s.

Conversely, the percentage of new science and engineering Ph.D.s with employment plans immediately after the doctorate has declined during the past 20 years. For the 1973-1976 Ph.D.s, 50 percent had definite employment plans and an additional 17 percent were seeking employment when they received their doctoral degrees. In contrast, approximately 64 percent of the Ph.D.s who graduated between 1960 and 1964 had definite employment plans, and another 11 percent were still seeking jobs at graduation time.

Plans at graduation also appear to be related to the field in which the degree is granted. For example, while Ph.D.s with degrees in the EMP fields (engineering, mathematics, computer sciences, and the physical sciences) resemble the total science and engineering population in their immediate postdoctoral plans, those with degrees in the life sciences and behavioral/social sciences have plans that are considerably different.

Over 44 percent of the 1973-1976 Ph.D.s with life science degrees had made a definite commitment for postdoctoral study or were seeking such an appointment immediately following the receipt of their doctoral degree. Less than 50 percent of those Ph.D.s planned to accept or seek employment immediately after receiving their doctorates. This trend of pursuing postdoctoral study is particularly evident among the most recent life sciences Ph.D.s; as few as 29 percent of the 1977-1980 graduates had definite employment plans at graduation compared to 56 percent of the 1960-1964 graduates. These trends could be attributed to a number of factors, such as the tight employment market, the necessity for additional study in order to pursue one's own research endeavors, the benefit of having advanced training before seeking employment, and the increased availability of postdoctoral appointments for life scientists.

Table 1.4 points out that far fewer postdoctoral appointments are available to Ph.D.s in the behavorial and social sciences areas than in life sciences; therefore, they are much more likely to enter the job market as soon as they graduate. For 1973-1976 Ph.D.s in the behavorial or social sciences fields, 84 percent were either seeking employment or were committed to a job immediately after receipt of their doctoral degrees.

TABLE 1.4 Postgraduation Plans of 1960-1980 Science and Engineering Ph.D.s in the United States in 1981 by Year and Field of Doctorate

Field of Doctorate and Plans at Ph.D.	Total 1960-1980	Year of Doctorate 1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Sci/Eng Ph.D.s	286,800	37,100	47,800	69,800	67,000	65,100
	%	%	%	%	%	%
Study Plans	22.0	12.4	14.4	21.7	25.0	30.4
Definite	18.0	12.4	13.9	16.9	19.8	23.7
Seeking	4.0	0.0	0.5	4.8	5.3	6.7
Employment Plans	70.0	75.8	76.2	70.0	66.7	65.7
Definite	55.9	64.4	65.5	56.0	50.2	49.9
Seeking	14.1	11.3	10.7	14.1	16.5	15.8
Other/Unknown Plans	7.9	11.8	9.4	8.2	8.3	3.9
EMP* Ph.D.s	129,100	18,600	25,100	34,000	27,700	23,700
	%	%	%	%	%	%
Study Plans	20.0	11.1	12.6	22.0	26.8	29.1
Definite	16.5	11.1	12.5	16.3	19.8	21.6
Seeking	4.4	0.0	0.1	5.6	7.0	7.5
Employment Plans	70.1	74.9	76.7	69.9	64.3	66.9
Definite	56.4	64.5	66.0	55.2	48.5	51.0
Seeking	13.7	10.5	10.7	14.4	15.8	15.9
Other/Unknown Plans	9.0	14.0	10.7	8.5	8.9	4.0
Life Sciences* Ph.D.s	72,100	9,600	11,100	17,000	17,000	17,400
	%	%	%	%	%	%
Study Plans	40.1	20.8	28.7	37.4	44.4	56.6
Definite	34.3	20.8	27.3	30.3	37.5	46.9
Seeking	5.8	0.1	1.5	7.1	6.8	9.6
Employment Plans	52.2	68.0	63.0	53.4	47.9	39.6
Definite	40.1	56.3	52.1	39.3	35.1	29.1
Seeking	12.1	11.7	10.9	14.0	12.7	10.6
Other/Unknown Plans	7.7	11.2	8.3	9.2	7.8	3.8
Behav/Soc Sci* Ph.D.s	85,600	8,900	11,500	18,800	22,400	24,000
	%	%	%	%	%	%
Study Plans	8.5	6.2	4.6	7.1	8.2	12.6
Definite	6.7	6.2	4.3	6.0	6.3	8.9
Seeking	1.8	0.0	0.4	1.1	1.9	3.7
Employment Plans	84.9	85.8	87.9	85.9	83.8	83.4
Definite	68.5	73.2	77.3	72.4	63.7	64.0
Seeking	16.4	12.6	10.6	13.5	20.2	19.4
Other/Unknown Plans	6.5	8.0	7.4	6.9	7.9	4.0

*EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Social Sci = Psychology and other social sciences.

Note: Vertical subtotals may not agree with Totals because of rounding.

SOURCE: National Research Council.

Summary

The previous tables show the tremendous growth in the number of doctoral degrees awarded in science and engineering during the 1970s, compared to past decades, including the increasing representation of women and racial/ethnic minority group members. How the postgraduation plans of science and engineering Ph.D.s, particularly the 1973-1976 graduates, varied over the past 20 years was seen in Table 1.4. By 1981, the 1973-1976 graduates had been in the doctoral labor pool for 5-8 years and, therefore, had made or were making decisions concerning their ultimate career goals. How their postgraduation plans relate to actual employment will be examined in the following sections of the report. The 1981 employment status of these individuals will also be compared to that of other Ph.D. year groups in 1981, as well as with Ph.D.s who were 5-8 years away from the doctorate in 1975, 1977, and 1979.

EMPLOYMENT STATUS OF 1973-1976 PH.D.S

Of the estimated 67,000 science and engineering Ph.D.s who received their doctoral degrees between 1973 and 1976, 93 percent were employed full-time, and 2 percent were employed part-time in February 1981 (Table 1.5). The extent of full-time employment varied by field. Virtually, all of the 1973-1976 engineering and computer sciences Ph.D.s were employed in full-time positions in 1981 (98 and 99 percent, respectively). The lowest rate of full-time employment was reported by 1973-1976 Ph.D.s with degrees in the biological sciences (87 percent). The 1973-1976 psychology Ph.D.s had the highest rate of part-time employment (6 percent), but analysis of SDR data showed that most of them indicated that they were not seeking full-time jobs.

As many as 6 percent of the 1973-1976 biological sciences Ph.D.s held postdoctoral appointments in 1981. It may be assumed this high percentage is related to both the tight job market and the fact that postdoctoral appointments were viewed as an option for increasing one's chances for future employment. Nonetheless, it should be noted that these Ph.D.s have been in the doctoral labor pool for 5-8 years and are in temporary positions having salaries generally lower than those for regular jobs. Further evidence of the gloomy employment situation for biological scientists is that 2 percent were unemployed and actively seeking jobs; for all science and engineering Ph.D. fields combined, the percentage who were unemployed but seeking employment is slightly less than one percent.

TABLE 1.5 1981 Employment Status of 1973-1976 Science and Engineering Ph.D.s by Field of Doctorate

		1981 Employment Status				
Field of Doctorate	Total	Full Time Empl	Part Time Empl	Post Doc Appt	Unempl Seek'g Empl	Other/ No Report
	N	%	%	%	%	%
All Fields	67,000	93.4	2.0	1.9	0.9	1.8
Mathematics	3,400	96.4	1.4	0.7	0.1	1.5
Computer Sciences	700	98.2	0.7	0.4	0.3	0.4
Physics/Astronomy	4,600	95.5	0.8	2.4	0.4	0.9
Chemistry	6,500	94.0	1.7	2.2	0.7	1.5
Earth/Envir Sci	2,300	93.9	3.4	1.0	0.4	1.3
Engineering	10,100	98.7	0.1	0.5	0.3	0.4
Agricultural Sci	2,700	97.5	0.6	0.1	0.6	1.3
Medical Sciences	2,300	92.2	2.2	4.1	0.4	1.1
Biological Sciences	12,000	87.0	2.2	6.0	1.9	2.9
Psychology	10,100	89.8	5.6	0.5	1.7	2.4
Social Sciences	12,300	95.2	1.4	0.3	0.9	2.2

SOURCE: National Research Council.

Postgraduation Plans

The relationship between postgraduation plans and the 1981 employment status of 1973-1976 science and engineering Ph.D.s is shown in Table 1.6. Overall, a higher percentage of the individuals who had firm employment plans when they received their Ph.D. were full-time employed in 1981 (97 percent), compared to those who were still seeking employment at graduation (91 percent). On the other hand, 1973-1976 science and engineering Ph.D.s who were still seeking employment at graduation were more frequently part-time employed (3 percent) or not employed (4 percent) in 1981 than those with firm postdoctoral or employment plans. This is especially true for Ph.D.s in the behavioral and social sciences, where of those still seeking employment at graduation, 5 percent were part-time employed and another 7 percent were not employed in 1981.

Overall, 6 percent of the 1973-1976 science and engineering Ph.D.s with definite postgraduation plans for postdoctoral study still held postdoctoral appointments in 1981, 5-8 years after receiving their doctorate. Among life scientists, the percentage of Ph.D.s who were still on postdoctoral appointments in 1981 was even higher (10 percent).

Also of note is the fact that irregardless of immediate postgraduation plans, 99 percent of the 1973-1976 Ph.D.s in computer sciences and engineering were employed full-time in 1981--a reflection of the current labor market demand for such individuals.

Comparisons With Other Ph.D. Year Cohorts

Of the 341,000 science and engineering Ph.D.s in the U.S. labor force in 1981, 93 percent were employed in full-time jobs in February 1981 (Table 1.7). Ph.D.s employed part-time comprised 3 percent of the labor force, and those on postdoctoral appointments accounted for another 3 percent. Although only 0.8 percent of the total 1981 doctoral science and engineering labor force were unemployed and seeking employment, the percentage of Ph.D.s in this category is highest for the most recent graduates (i.e., 1.2 percent for the 1977-1980 group and 1.0 percent for 1973-1976 Ph.D.s).

The percentage of Ph.D.s employed in full-time positions in 1981 is fairly constant for those who received their doctorates prior to the mid-1970s (97 percent for the 1960-1972 graduates), with the exception of Ph.D.s close to retirement (1938-1959 graduates), who elected to be employed in part-time jobs. The percentage of 1973-1976 Ph.D.s who were employed full-time is somewhat smaller (95 percent). However, a small percentage of the 1973-1976 Ph.D.s were still on postdoctoral appointments in 1981. The temporary, short-term nature of postdoctoral appointments is further reflected in the fact that although 13 percent of the 1977-1980 science and engineering Ph.D.s in the 1981 U.S. labor force held postdoctoral appointments, only 2 percent of the 1973-1976 cohort were in such positions.

In comparison with other science and engineering fields, the more difficult employment situation facing life sciences Ph.D.s is shown in Table 1.7. As many as 32 percent of the 1977-1980 and 5 percent of the 1973-1976 life scientists in the U.S. labor force in 1981 held postdoctoral appointments.

TABLE 1.6 1981 Employment Status of 1973-1976 Science and Engineering Ph.D.s by Field of Doctorate and Plans at Ph.D.

Field of Doctorate and 1981 Employment Status	Total All Plans*	Plans at Ph.D. Study Plans Definite	Study Plans Seeking	Employment Plans Definite	Employment Plans Seeking
Total Science/Engineering Ph.D.s	67,000	13,200	3,500	33,600	11,100
	%	%	%	%	%
Full-Time Employed	93.4	89.3	87.6	96.7	91.1
Part-Time Employed	2.0	2.2	4.0	1.3	3.1
Seeking F-T Employment	0.6	0.6	1.1	0.1	1.6
Not Seeking/No Report	1.5	1.3	2.8	1.1	1.5
Postdoctoral Appointment	1.9	5.7	4.2	0.4	1.0
Unemployed, Seeking Employment	0.9	1.1	2.1	0.4	1.4
Not in Labor Force	1.4	1.5	1.6	0.9	2.9
Math/Physical Science** Ph.D.s	16,800	4,600	1,500	6,700	2,500
	%	%	%	%	%
Full-Time Employed	94.9	93.5	90.4	97.5	93.9
Part-Time Employed	1.6	1.9	3.1	0.8	1.9
Seeking F-T Employment	0.4	0.5	0.7	0.2	0.6
Not Seeking/No Report	1.2	1.3	1.4	0.3	1.3
Postdoctoral Appointment	1.8	2.7	3.1	0.6	1.4
Unemployed, Seeking Employment	0.5	0.3	1.4	0.5	0.3
Not in Labor Force	0.9	0.9	1.4	0.4	1.9
Computer Sci/Engineering Ph.D.s	10,800	900	400	6,800	1,800
	%	%	%	%	%
Full-Time Employed	98.7	99.0	99.1	99.0	98.5
Part-Time Employed	0.2	1.0	0.0	0.1	0.1
Seeking F-T Employment	0.0	0.0	0.0	0.0	0.0
Not Seeking/No Report	0.2	0.0	0.0	0.1	0.1
Postdoctoral Appointment	0.5	0.0	0.0	0.4	1.2
Unemployed, Seeking Employment	0.3	0.0	0.9	0.0	0.1
Not in Labor Force	0.3	0.0	0.0	0.5	0.1
Life Science** Ph.D.s	17,000	6,400	1,200	6,000	2,200
	%	%	%	%	%
Full-Time Employed	89.4	85.7	80.0	95.2	89.8
Part-Time Employed	2.0	1.1	5.0	1.5	3.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Postdoctoral Appointment	4.8	9.6	8.9	0.6	1.7
Unemployed, Seeking Employment	1.5	1.8	2.8	0.2	2.7
Not in Labor Force	2.1	1.8	3.0	1.8	2.4
Behav/Soc Science** Ph.D.s	22,400	1,400	400	14,300	4,500
	%	%	%	%	%
Full-Time Employed	92.8	85.9	87.2	96.0	87.1
Part-Time Employed	3.3	9.4	8.4	2.0	4.8
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Postdoctoral Appointment	0.4	1.3	0.0	0.3	0.4
Unemployed, Seeking Employment	1.3	0.7	3.9	0.6	2.0
Not in Labor Force	1.9	2.6	0.0	1.0	5.0

*Includes Ph.D.s whose postgraduation plans were unknown.

**Physical Sci = Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Social Sciences = Psychology and other social sciences.

SOURCE: National Research Council.

TABLE 1.7 1981 Employment Status of Science and Engineering Ph.D.s in the U.S. Labor Force by Field and Year of Doctorate

Field of Doctorate and 1981 Employment Status	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Labor Force	341,000	59,500	35,900	47,100	68,700	65,800	64,000
	%	%	%	%	%	%	%
Full-Time Employed	93.1	92.8	97.1	97.3	96.7	95.1	82.2
Part-Time Employed	3.0	6.6	2.0	1.8	2.0	2.1	3.3
Postdoctoral Appt	3.1	0.1	0.2	0.3	0.6	1.9	13.4
Unemployed, Seeking Empl	0.8	0.5	0.6	0.6	0.7	1.0	1.2
EMP* Ph.D.s	157,200	29,500	18,300	24,900	33,700	27,400	23,400
	%	%	%	%	%	%	%
Full-Time Employed	95.6	93.5	98.3	98.0	97.7	97.3	88.6
Part-Time Employed	2.1	5.9	1.2	1.1	1.3	1.1	1.1
Postdoctoral Appt	1.9	0.1	0.2	0.4	0.6	1.3	9.7
Unemployed, Seeking Empl	0.5	0.5	0.3	0.5	0.4	0.4	0.6
Life Sciences* Ph.D.s	86,200	16,100	9,200	10,900	16,600	16,600	16,800
	%	%	%	%	%	%	%
Full-Time Employed	88.6	93.1	97.3	96.6	96.2	91.6	64.2
Part-Time Employed	2.8	6.0	1.8	2.0	1.8	2.0	2.3
Postdoctoral Appt	7.4	0.0	0.2	0.6	0.8	4.9	31.8
Unemployed, Seeking Empl	1.2	0.8	0.7	0.9	1.2	1.5	1.7
Behav/Social Sci* Ph.D.s	97,500	13,800	8,400	11,300	18,400	21,900	23,800
	%	%	%	%	%	%	%
Full-Time Employed	93.0	90.8	94.2	96.4	95.4	95.0	88.5
Part-Time Employed	4.9	9.0	4.1	3.2	3.4	3.4	6.1
Postdoctoral Appt	1.2	0.1	0.3	0.0	0.5	0.4	4.0
Unemployed, Seeking Empl	0.9	0.1	1.5	0.4	0.7	1.3	1.3

*EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Social Sci = Psychology and other social sciences.

SOURCE: National Research Council.

FIELD MOBILITY

Field mobility is defined in this report as "having earned a Ph.D. in one field and being employed in another field." The mobility from doctorate specialty to field of employment for 1973-1976 science and engineering Ph.D.s who were employed full-time or part-time in 1981 is given in Table 1.8. At least 85 percent of the Ph.D.s in engineering, psychology, the earth/environmental sciences, and the medical sciences were employed in the same broad field as their doctoral degree specialty. Ph.D.s with degrees in physics/astronomy and mathematics had the highest rate of field mobility--as few as 60 percent and 66 percent, respectively, were working in jobs in their doctoral field.

It should be noted, however, that individuals who switch fields often accept jobs in related fields. For example, more than one-fifth of the 1973-1976 mathematics Ph.D.s and one-fourth of the physics Ph.D.s were employed in the fields of computer sciences or engineering, and 12 percent of the biological science Ph.D.s were working in the medical sciences field. Among the 1973-1976 social sciences Ph.D.s, 8 percent indicated that they were employed in jobs in the "professional fields," which includes the subfield of social work.

TABLE 1.8 Field Mobility of 1973-1976 Science and Engineering Ph.D.s*: Doctoral Specialty to 1981 Employment Specialty

	Field of Doctorate											
1981 Employment Field	All Fields	Mathematics	Computer Sciences	Physics/Astronomy	Chemistry	Earth/Envir. Sciences	Engineering	Agricultural Sciences	Medical Sciences	Biological Sciences	Psychology	Social Sciences
Total Employed	64,000	3,300	700	4,500	6,200	2,200	10,000	2,700	2,100	10,700	9,600	11,900
	%	%	%	%	%	%	%	%	%	%	%	%
Mathematics	3.7	[redacted]	0.8	0.0	0.1	0.0	0.7	0.5	0.0	0.5	0.0	0.2
Computer Sciences	3.4	16.1	[redacted]	9.5	0.9	0.2	3.1	0.9	0.2	0.3	1.1	0.6
Physics/Astronomy	4.5	0.0	0.0	[redacted]	0.9	0.8	1.1	0.0	0.0	0.1	0.0	0.3
Chemistry	8.2	0.0	0.0	1.2	[redacted]	0.8	1.1	1.3	1.0	1.1	0.0	0.0
Earth/Envir. Sciences	4.7	0.1	0.0	4.3	2.2	[redacted]	2.7	1.2	0.2	3.0	0.2	1.0
Engineering	15.7	5.5	15.2	15.0	3.5	4.0	[redacted]	0.4	0.0	1.2	0.8	0.4
Agricultural Sciences	3.9	0.0	0.0	0.3	0.0	1.8	0.0	[redacted]	0.0	2.2	0.0	1.3
Medical Sciences	6.4	0.9	0.4	2.7	3.2	0.7	0.5	1.6	[redacted]	12.0	2.1	1.9
Biological Sciences	13.8	2.8	0.0	0.6	3.4	2.3	0.6	4.8	6.6	[redacted]	1.5	0.0
Psychology	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1	[redacted]	0.3
Social Sciences	15.0	2.4	0.1	0.8	0.2	0.0	0.8	3.6	0.4	0.2	[redacted]	[redacted]
Education	1.4	1.6	1.3	0.6	0.8	0.4	0.0	0.6	0.5	0.6	2.5	3.5
Professional Fields	2.6	2.4	0.1	1.7	1.9	0.6	0.9	3.7	0.1	1.1	1.0	8.1
Humanities	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0	0.0	1.6
Other/No Report	3.4	2.6	0.4	3.3	4.3	2.3	3.5	2.6	1.9	2.9	3.0	4.8

*Includes full-time and part-time employed individuals.

SOURCE: National Research Council.

When academic and nonacademic sectors are examined separately, the picture changes even more dramatically for certain science and engineering fields (Table 1.9). For 1973-1976 mathematics Ph.D.s, 83 percent of those academically employed (i.e., 2-year colleges, 4-year colleges, medical schools, or universities) in 1981 were working in mathematics compared to only 35 percent of those in nonacademic jobs. Similar differences may be seen for Ph.D s in physics/astronomy, the biological sciences, and the social sciences. For Ph.D.s in other science and engineering fields, the percentage employed in the doctoral specialty area did not differ significantly by sector of employment.

TABLE 1.9 Percentage of 1973-1976 Science and Engineering Ph.D.s Employed in Doctoral Specialty Area by Academic/Nonacademic* Employment Sector, 1981

Field of Doctorate	Academic		Nonacademic	
	Total Empl	Empl in Field	Total Empl	Empl in Field
	(N)	(%)	(N)	(%)
Mathematics	2,100	83.0	1,200	34.9
Computer Sciences	300	91.1	500	76.3
Physics/Astronomy	1,800	79.8	2,700	47.0
Chemistry	1,900	79.2	4,400	77.9
Earth/Environ. Sciences	1,000	84.9	1,300	87.4
Engineering	2,800	84.8	7,200	85.3
Agricultural Sciences	1,300	79.7	1,300	75.5
Medical Sciences	1,300	90.4	900	87.0
Biological Sciences	6,500	83.1	4,200	61.5
Psychology	4,400	82.3	5,200	88.5
Social Sciences	8,000	84.0	3,700	60.7

*Nonacademic = business/industry, self-employment, government (U.S., state, local), elementary/secondary schools, hospitals/clinics, private foundations, other nonprofit organizations, and any other employers, excluding academe; Academic = 2-year colleges, 4-year colleges, medical schools, and universities.

SOURCE: National Research Council.

The reasons that Ph.D.s give for accepting employment outside their area of specialty after years of study may reflect how these individuals perceive employment opportunities in the various fields of science and engineering (Table 1.10).

Regardless of sex, the major reason given by 1973-1976 science and engineering Ph.D.s for accepting full-time employment in a field other than their doctoral specialty area is that more attractive career options were available in the new area (44 percent). In contrast, 48 percent of the part-time employed Ph.D.s indicated that they were working outside their doctoral specialty because a position was not available in their Ph.D. area.

Women also cited family and marital constraints as a reason for being employed outside their Ph.D. area much more often than men (9 percent of the full-time employed women and 18 percent of the part-time employed women, in contrast to only 1 percent of the full-time employed men and none of the part-time employed men).

TABLE 1.10 Reasons Given by 1973-1976 Science and Engineering Ph.D.s for being Employed Outside Their Ph.D. Field by Employment Status and Sex, 1981

	Both Sexes		Men		Women	
Reasons Empl. Outside Ph.D. Fld	Full Time Empl	Part Time Empl	Full Time Empl	Part Time Empl	Full Time Empl	Part Time Empl
Total Reporting Reason*	12,200	400	10,400	200	1,800	200
	%	%	%	%	%	%
Better Pay	8.8	3.7	9.5	0.0	5.0	6.6
More Attractive Career Options	44.1	22.3	45.0	26.9	38.9	18.8
Preferred Geographic Location	3.9	1.2	3.7	0.0	4.7	2.2
Family/Marital Status Constraints	2.1	10.1	1.0	0.0	8.7	17.9
Posit. in Ph.D. Fld Not Available	16.2	47.5	16.6	64.6	14.2	34.5
Promoted Out of Ph.D. Field	8.7	0.5	8.7	0.0	9.1	0.9
Other	13.7	12.9	13.6	8.6	14.5	16.2
Multiple Reasons	2.3	1.7	1.9	0.0	5.0	3.1

*Includes only individuals who were working outside their doctoral specialty area and gave a reason on the 1981 SDR questionnaire for being so employed.

SOURCE: National Research Council.

From Table 1.8 it was shown that the incidence of employment in the doctoral specialty was dependent on the field of doctorate; hence, the reasons for working outside the doctoral specialty by field of doctorate may also vary by doctoral specialty.

As seen in Table 1.11, and as noted before, the most frequently reported reason for being employed outside one's specialty field was the availability of more attractive career options in another specialty area. For example, as many as 47 percent of the 1973-1976 Ph.D.s in the EMP fields gave "more attractive career options" as the reason for accepting employment outside their doctoral specialty area; for life scientists and behavorial/social scientists, this percentage was 38 and 41 percent, respectively. The absence of jobs in their Ph.D. fields was listed as the second most frequent reason for leaving those fields.

TABLE 1.11 Reasons Given by 1973-1976 Science and Engineering Ph.D.s. for Being Employed Outside Their Ph.D. Field in 1981 by Field of Doctorate

Reasons Empl Outside Ph.D. Fld	Total S/E	Field of Doctorate EMP* Fields	Life Sci*	Beh/Soc. Sci*
Total Reporting Reason*	12,600	6,400	2,700	3,500
	%	%	%	%
Better Pay	8.7	6.5	8.6	12.7
More Attractive Career Options	43.4	47.4	37.7	40.7
Preferred Geographic Location	3.8	5.2	2.2	2.5
Family/Marital Status Constraints	2.4	1.7	3.2	2.9
Position in Ph.D. Fld Not Available	17.2	16.5	15.1	20.2
Promoted Out of Ph.D. Field	8.5	9.1	8.3	7.4
Other	13.7	11.1	22.1	12.0
Multiple Reasons	2.3	2.5	2.8	1.7

*Includes only individuals who were working outside their doctoral specialty area and gave a reason on the 1981 SDR questionnaire for being so employed.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Beh/Soc Sci = Psychology and other social sciences.

SOURCE: National Research Council.

TYPE OF EMPLOYER

The increasing trend towards nonacademic employment among science and engineering doctorate recipients is shown in Table 1.12. A steady decrease in the percentage in academic employment is evident among at least the last 20 years' graduates. In 1981, 62 percent of the 1960-1964 Ph.D.s were employed in academe compared to only 48 percent of the 1977-1980 graduates. Conversely, the percentage reporting employment in business or industry is higher for graduates of the 1970s than it is for 1960s' graduates. On the other hand, approximately the same percentage (31 percent) of the most senior doctoral scientists and engineers (1938-1959 graduates) were working in business/industry in 1981 as were the most recent graduating cohort (1977-1980 Ph.D.s). It should be noted, however, that analysis of the SDR data showed that the older Ph.D.s were more often in self-employing enterprises.

Looking at percentages, one sees that the EMP fields have shown the largest shift into business and industry; 35 percent of the 1960-1964 Ph.D.s in EMP fields were working in business and industry settings in 1981 compared to 53 percent of the 1977-1980 graduates. Among behavorial and social scientists, nonacademic employment has also increased for more recent Ph.D.s, with the largest increases in percentages being shown in government and "other" nonacademic areas.

In 1981 almost half of the 1973-1976 science and engineering Ph.D.s were employed full-time or part-time at academic institutions, and another one-third were working in business or industry (Table 1.13). However, type of employer for these Ph.D.s differed dramatically, depending on the doctoral fields. Academe was the major employer of 1973-1976 Ph.D.s in mathematics (64 percent) and the medical (59 percent), biological (61 percent), and social sciences (67 percent) in 1981. Business and industry, on the other hand, employed a majority of the Ph.D.s in computer sciences (51 percent), chemistry (59 percent), and engineering (61 percent). Ph.D.s in the field of earth/environmental sciences had the largest percentage employed in government (25 percent). Ph.D.s in psychology were far more frequently self-employed (15 percent, included under business/industry) or working in "other" nonacademic jobs (23 percent, including hospitals and clinics) than were all other Ph.D.s.

TABLE 1.12 1981 Type of Employer of Science and Engineering Ph.D.s* by Field and Year of Doctorate

Field of Doctorate and 1981 Type of Employer	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Employed	327,800	59,100	35,500	46,700	67,800	64,000	54,600
	%	%	%	%	%	%	%
Academe	52.6	55.5	61.6	55.5	50.5	48.9	48.1
Nonacademe	47.2	44.3	38.2	44.4	49.4	50.9	51.8
Business/Industry	29.8	30.6	24.2	28.2	31.1	31.4	30.9
Government	9.8	7.8	8.8	10.5	10.9	10.6	9.9
Other	7.5	5.9	5.3	5.7	7.5	8.9	11.0
No Report	0.0	0.2	0.2	0.1	0.1	0.3	0.1
EMP** Ph.D.s, Empl	153,600	29,300	18,200	24,700	33,400	27,000	21,000
	%	%	%	%	%	%	%
Academe	42.1	45.6	54.4	47.5	38.2	36.1	34.2
Nonacademe	57.8	54.3	45.6	52.4	61.7	63.8	65.7
Business/Industry	34.7	44.1	34.5	38.2	46.1	50.1	52.8
Government	8.9	6.7	7.8	10.5	10.7	9.3	7.7
Other	4.2	3.5	3.3	3.8	4.6	4.4	5.2
No Report	0.1	0.1	0.0	0.1	0.1	0.1	0.1
Life Sci** Ph.D.s, Empl	78,700	16,000	9,100	10,700	16,200	15,500	11,200
	%	%	%	%	%	%	%
Academe	62.9	64.6	67.3	63.8	62.6	58.9	62.1
Nonacademe	36.9	35.2	32.1	36.2	37.3	41.0	37.7
Business/Industry	23.1	18.1	14.1	15.4	15.4	20.1	19.5
Government	12.8	10.4	12.1	13.6	14.3	13.7	11.0
Other	1.0	6.7	5.9	6.0	7.6	7.2	7.2
No Report	0.2	0.2	0.6	0.0	0.1	0.1	0.2
Beh/Soc Sci** Ph.D.s, Empl	95,500	13,800	8,200	11,200	18,200	21,500	22,500
	%	%	%	%	%	%	%
Academe	60.9	66.0	71.2	65.3	62.1	57.7	54.0
Nonacademe	38.8	33.5	28.7	34.4	37.7	41.8	45.8
[redacted]							
No Report	0.3	0.5	0.1	0.3	0.2	0.6	0.1

*Includes full-time and part-time employed Ph.D.s.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Beh/Soc Sci = Psychology and other social sciences.

Note: "Academe" includes 2-year colleges, 4-year colleges, medical schools and universities. "Business/Industry" also includes self-employment. "Other" includes elementary/secondary schools, private foundations, hospitals/clinics, other nonprofit organizations, and any other nonacademic employers.

SOURCE: National Research Council.

TABLE 1.13 1981 Type of Employer of 1973-1976 Science and Engineering Ph.D.s* by Field of Doctorate

Field of Doctorate	TOTAL Empl	Total Acad Empl	1981 Type of Employer					Total Nonac Empl				No Rpt
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		Bus/ Ind	Govt	Other	
	N	%	%	%	%	%	%	%	%	%	%	%
All Fields	64,000	48.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	50.9	31.4	10.6	8.9	0.3
Mathematics	3,300	63.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	36.5	[illegible]	[illegible]	[illegible]	0.0
Computer Sciences	700	36.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	64.0	[illegible]	[illegible]	[illegible]	0.0
Physics/Astronomy	4,500	39.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	60.6	[illegible]	[illegible]	[illegible]	0.0
Chemistry	6,200	29.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	70.0	[illegible]	[illegible]	[illegible]	0.1
Earth/Envir. Sci	2,200	43.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	56.3	[illegible]	[illegible]	[illegible]	0.1
Engineering	10,000	27.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	72.0	[illegible]	[illegible]	[illegible]	0.3
Agricultural Sci	2,700	50.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	49.4	[illegible]	[illegible]	[illegible]	0.4
Medical Sciences	2,100	58.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	41.0	[illegible]	[illegible]	[illegible]	0.1
Biological Sci	10,700	61.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	38.9	[illegible]	[illegible]	[illegible]	0.1
Psychology	9,600	45.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	54.4	[illegible]	[illegible]	[illegible]	0.0
Social Sciences	11,900	67.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31.5	10.6	11.3	9.5	1.1

*Includes full-time and part-time employed only.

Note: "Bus/Ind" includes self-employment; "Other" includes elementary/ secondary schools, private foundations, hospitals/clinics, other nonprofit organizations, and any other nonacademic employers.

SOURCE: National Research Council.

Postgraduation Plans

Immediate postgraduation plans appear to have some relationship to the type of employment that science and engineering Ph.D.s hold 5-8 years after they graduate. Among 1973-1976 science and engineering Ph.D.s employed in 1981, almost 80 percent of those who had definite plans for academic employment immediately after receiving their doctorate were still in academe, and as many as 87 percent of those with definite job offers in nonacademic settings immediately after the doctorate were still working outside academe 5-8 years later (Table 1.14). Of those employed in 1981 who had been seeking academic employment when they graduated, only 62 percent were actually working in academe. On the other hand, as many as 80 percent of those employed in 1981 who had been seeking nonacademic positions when they graduated were nonacademically employed.

Compared to Ph.D.s in other science and engineering fields, EMP Ph.D.s had lower retention rates in academic job settings (73 percent of those employed in 1981 with definite postgraduation plans for academic jobs were still in academe and 53 percent of those who were seeking academic jobs when they graduated were in academic jobs in 1981). However, for those EMP Ph.D.s who had definite nonacademic job plans at graduations as many as 89 percent were still in nonacademic job settings in 1981.

Longitudinal Analyses

This shift to nonacademic jobs can also be seen in Table 1.15, which compares the employment sector of science and engineering Ph.D.s who were 5-8 years past receipt of the doctorate in 1975, 1977, 1979, and 1981. About 57 percent of the 1967-1970 science and engineering Ph.D.s were academically employed in 1975--in comparison with 55 percent of the 1969-1972 graduates in 1977, 50 percent of the 1971-1974 graduates in 1979, and 49 percent of the 1973-1976 graduates in 1981. The largest relative decline in academic employment between 1975 and 1981 occurred among the EMP Ph.D.s--47 percent of the 1967-1970 graduates were employed in academe in 1975, while only 36 percent of the 1973-1976 graduates were so employed in 1981. It should be noted, however, that the largest percentage change occurred between 1977 and 1979, with only a slight change between 1979 and 1981.

TABLE 1.14 Type of Employer in 1981 for 1973-1976 Science and Engineering Ph.D.s* by Field of Doctorate and Plans at Ph.D.

Field of Doctorate and 1981 Employment Sector	Total All Plans+	Postgraduation Plans: Study Plans: Definite	Study Plans: Seeking	Definite Empl: Acad	Definite Empl: Nonac	Seeking Empl: Acad	Seeking Empl: Nonac
Total Employed in 1981	64,000	12,100	3,200	18,900	14,000	5,400	5,000
	%	%	%	%	%	%	%
Academically Employed	48.9	52.2	44.5	79.2	12.9	61.7	20.6
Nonacad. Employed	50.9	47.8	54.7	20.2	87.1	38.1	79.3
EMP** Ph.D.s, Empl	27,000	5,300	1,800	5,200	8,100	1,800	2,400
	%	%	%	%	%	%	%
Academically Employed	36.1	45.3	33.2	73.2	10.7	53.2	12.1
Nonacad. Employed	63.8	54.7	65.4	26.7	89.3	46.8	87.7
Life Sci** Ph.D.s, Empl	15,500	5,500	1,000	3,900	1,900	1,100	1,000
	%	%	%	%	%	%	%
Academically Employed	58.9	58.7	58.5	82.5	18.6	63.7	36.5
Nonacad. Employed	41.0	41.3	41.4	17.3	81.4	35.3	63.5
Beh/Soc Sci** Ph.D.s, Empl	21,500	1,300	400	9,800	4,100	2,600	1,600
	%	%	%	%	%	%	%
Academically Employed	57.7	52.8	61.9	81.0	14.7	66.8	24.1
Nonacad. Employed	41.8	47.2	38.1	17.9	85.3	33.1	75.9

*Percentages based on total full-time and part-time employed, including those who did not report their type of employer.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Beh/Social Sci = Psychology and other social sciences.

+Includes those Ph.D.s whose postgraduation plans were unknown.

Note: "Nonacademic" = business/industry, self-employment, government (U.S., state, local), elementary/secondary schools, hospitals/clinics, private foundations, other nonprofit organizations, and any other employers, excluding academe; "Academic" = 2-year colleges, 4-year colleges, medical schools, and universities.

SOURCE: National Research Council.

TABLE 1.15 Type of Employer of Science and Engineering Ph.D.s 5-8 Years after the Doctorate (1975-1981)

Field of Doctorate and Empl Sector	1975 1967-1970 Ph.D.s	1977 1969-1972 Ph.D.s	1979 1971-1974 Ph.D.s	1981 1973-1976 Ph.D.s
Total Employed*	55,800	64,600	65,900	64,000
	%	%	%	%
Academic	57.2	55.1	49.8	48.8
Nonacademic	42.7	44.6	49.9	50.9
EMP,** Empl	29,700	31,800	30,300	27,000
	%	%	%	%
Academic	46.9	43.4	37.2	36.1
Nonacademic	53.0	56.3	62.6	63.8
Life Sci,** Empl	12,900	15,400	15,800	15,500
	%	%	%	%
Academic	67.4	65.5	62.0	58.9
Nonacademic	32.5	34.2	37.7	41.0
Beh/Soc Sci,** Empl	13,200	17,400	19,800	21,500
	%	%	%	%
Academic	70.2	67.3	59.4	57.7
Nonacademic	29.7	32.3	40.4	41.8

*Includes those full-time and part-time employed, including "No reports" to "Type of Employer" question.

** EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Beh/Soc Sci = Psychology and other social sciences.

Note: Vertical subtotals may not agree with TOTALS because of rounding; "Nonacademic" = business/industry, self-employment, government (U.S., state, local), elementary/secondary schools, hospitals/clinics, private foundations, other nonprofit organizations, and any other employers, excluding academe; "Academic" = 2-year colleges, 4-year colleges, medical schools, and universities.

SOURCE: National Research Council.

TENURE STATUS

It appears that most tenure decisions are made within 8-9 years after receipt of the doctoral degree (Table 1.16). Only 10 percent of the academically employed 1977-1980 science and engineering Ph.D.s and 44 percent of the 1973-1976 group had obtained tenure by 1981, whereas for 1969-1972 Ph.D.s, three out of four (and seven out of eight in track positions) were tenured in 1981.

The most striking statistic, however, is the increase in the percentage of Ph.D.s in nontenure-track positions among the more recent Ph.D. cohorts. As many as 17 percent of the 1973-1976 academically employed Ph.D.s did not hold a tenure-track position in February 1981. This percentage increased to 26 percent for the most recent graduates (1977-1980 Ph.D.s).

TABLE 1.16 1981 Tenure Status of Academically* Employed Science and Engineering Ph.D.s by Year of Ph.D.

Tenure Status	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Acad. Empl*	167,500	31,800	21,200	25,400	33,200	30,100	25,800
	%	%	%	%	%	%	%
Track Position	83.9	91.6	92.3	90.9	84.3	78.2	66.4
Tenured	65.8	90.4	89.9	86.6	74.0	43.5	10.3
Not Tenured	18.1	1.2	2.4	4.3	10.4	34.6	56.1
Nontenure Track	12.0	5.8	5.4	6.3	11.8	16.5	26.0
Not Tenured, Stat Unk	3.1	1.4	1.3	2.2	2.8	4.3	6.8
No Report	1.0	1.2	1.0	0.6	1.1	1.0	0.8

*Includes those employed full-time and part-time at colleges, medical schools, and universities, excluding university-operated federally funded R&D Centers.

SOURCE: National Research Council.

Longitudinal Analyses

The increasing trend among the more recent science and engineering Ph.D.s to accept postdoctoral appointments immediately after the doctorate, and its effects on the eventual attainment of tenure, is seen in Table 1.17. This table provides a comparison of the tenure status of Ph.D.s 5-8 years after they received their degrees between 1975 and 1981. Data from the 1981 SDR are used for Ph.D.s who graduated between 1973 and 1976; 1979 data for 1971-1974 Ph.D.s; 1977 data for 1969-1972 Ph.D.s; and 1975 data for 1967-1970 Ph.D.s. This table shows the variation in the rate of attaining tenure in recent years, which is evidently related to the tight academic job market.

While 52 percent of the academically employed 1967-1970 science and engineering Ph.D.s were tenured in 1975, only 44 percent of the 1973-1976 Ph.D.s were tenured in 1981. This comparison is even more striking within individual fields. For Ph.D.s in the EMP fields, 54 percent of the 1967-1970 Ph.D. group had tenure in 1975, while only 42 percent of the 1973-1976 doctorates had tenure in 1981.

TABLE 1.17 Tenure Status of Science and Engineering Ph.D.s Employed in Academe* 5-8 Years after the Doctorate (1975-1981)

	Tenured			
	1975	1977	1979	1981
Field of Doctorate	1967-1970 Ph.D.s	1969-1972 Ph.D.s	1971-1974 Ph.D.s	1973-1976 Ph.D.s
	%	%	%	%
Science and Engineering Total	52.0	50.4	45.3	43.5
EMP Fields**	54.4	49.9	43.5	42.0
Life Sciences**	42.2	39.9	34.3	35.4
Behavorial/Social Sciences**	57.9	59.8	55.9	50.5

*Includes those employed full-time or part-time at colleges, medical schools, and univerities, excluding university-operated federally funded R&D Centers.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behavioral/Social Sciences = Psychology and other social sciences.

SOURCE: National Research Council.

Type of Institution

Both tenure status and attainment of tenure differ according to the type of academic institution where the individual is employed (Table 1.18). Overall, as many as 15 percent of the full-time academically employed 1973-1976 science and engineering Ph.D.s were in nontenure-track positions in 1981. This percentage varied by type of institution--17 percent for medical schools/universities, 15 percent for the 2-year colleges, and 8 percent for 4-year colleges.

TABLE 1.18 1981 Tenure Status of Full-Time Academically Employed 1973-1976 Science and Engineering Ph.D.s* by Type of Institution and Field of Doctorate

Type of Employer and Tenure Status	Total S/E	Field of Doctorate: EMP Flds**	Life Sci**	Behav /Soc Sci**
Total F-T Acad. Empl	29,500	8,500	8,900	12,100
	%	%	%	%
Track Position	79.5	80.2	73.4	83.4
Tenured	[illegible]	[illegible]	36.0	[illegible]
Not Tenured	[illegible]	[illegible]	37.5	[illegible]
Nontenure Track	15.3	13.6	19.7	13.3
Not Tenured, Pos. Unk	4.3	5.0	5.5	2.9
No Report	0.9	1.2	1.4	0.4
2-Yr Colleges	1,000	300	300	400
	%	%	%	%
Track Position	83.4	87.4	90.1	75.8
Tenured	[illegible]	[illegible]	[illegible]	[illegible]
Not Tenured	[illegible]	[illegible]	[illegible]	[illegible]
Nontenure Track	14.6	11.9	6.7	22.0
Not Tenured, Pos. Unk	1.8	0.0	3.2	2.2
No Report	0.2	0.6	0.0	0.0
4-Yr Colleges	5,900	1,800	1,000	3,100
	%	%	%	%
Track Position	86.9	85.2	84.1	88.7
Tenured	[illegible]	[illegible]	[illegible]	[illegible]
Not Tenured	[illegible]	[illegible]	[illegible]	[illegible]
Nontenure Track	8.2	6.7	13.2	7.4
Not Tenured, Pos. Unk	4.5	6.7	2.7	3.9
No Report	0.4	1.4	0.0	0.0
Med Schools/Universities	22,600	6,300	7,700	8,600
	%	%	%	%
Track Position	77.4	78.5	71.4	81.9
Tenured	[illegible]	[illegible]	[illegible]	[illegible]
Not Tenured	[illegible]	[illegible]	[illegible]	[illegible]
Nontenure Track	17.2	15.6	21.0	15.0
Not Tenured, Pos. Unk	4.3	4.8	5.9	2.6
No Report	1.1	1.2	1.6	0.6

*Includes those employed full-time or part-time at colleges, medical schools, and universities, excluding university-operated federally funded R&D Centers.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Soc Sci = Psychology and other social sciences.

Note: Vertical subtotals may not agree with Totals because of rounding.

SOURCE: National Research Council.

Those Ph.D.s employed by medical schools or universities had the lowest incidence of tenure (40 percent), whereas the highest incidence occurred for those employed by 2-year colleges (68 percent). However, it must be noted from Table 1.18 that over three-fourths of the full-time academically employed 1973-1976 science and engineering Ph.D.s were employed by medical schools and universities (22,600), whereas only 3 percent were employed by 2-year colleges (1,000).

When examined by field, virtually nine out of every ten of the 1973-1976 life sciences Ph.D.s employed at 2-year colleges were either tenured (80 percent) or in tenure-track positions (10 percent). Life scientists did not fare as well in other academic settings. In medical schools and universities, as many as 21 percent of the 7,700 life scientists were in nontenure-track positions. In contrast, in the 4-year college, university, or medical school settings, Ph.D.s with degrees in behavorial and social sciences had the highest incidence of tenure or tenure-track positions (89 percent in 4-year colleges and 82 percent in medical schools/universities).

Sex

Women employed full-time at medical schools or universities were more likely than men to hold nontenure-track positions--23 percent of the women compared to 16 percent of the men (Table 1.19). The largest difference was seen for life sciences Ph.D.s employed at medical schools or universities: 32 percent of the women held nontenure-track positions, compared to only 18 percent of the men. Interestingly enough, tenure status did not differ dramatically by sex for Ph.D.s in the behavorial and social sciences, these being the more traditional science fields for women doctorate recipients. For those full-time employed at 4-year colleges, women fared about the same as men in obtaining tenure-track positions, although the data suggest that female EMP and life science Ph.D.s obtain tenure at a somewhat slower rate than men.

TABLE 1.19 1981 Tenure Status of 1973-1976 Science and Engineering Ph.D.s Employed Full-Time at 4-Year Colleges or Universities by Sex, Type of Employing Institution, and Field of Doctorate

Field of Doctorate and Tenure Status	Type of Employer and Sex: 4-Year Colleges Men	4-Year Colleges Women	Med Sch/Univ* Men	Med Sch/Univ* Women
Total F-T Acad Empl	4,700	11,200	18,800	3,800
	%	%	%	%
Track Position	87.1	86.1	79.1	69.0
Tenured	55.8	54.3	41.6	34.2
Not Tenured	31.3	31.8	37.5	34.8
Nontenure Track	8.6	6.5	16.1	23.0
EMP** Ph.D.s, F-T Acad	1,600	200	5,900	400
	%	%	%	%
Track Position	85.0	87.1	79.1	68.4
Tenured	50.2	45.2	40.7	29.9
Not Tenured	34.8	41.9	38.4	38.6
Nontenure Track	6.5	9.7	15.0	25.1
Life Sci** Ph.D.s, F-T Acad	700	300	6,200	1,500
	%	%	%	%
Track Position	83.2	86.4	75.1	56.0
Tenured	53.6	47.0	34.2	24.2
Not Tenured	29.6	39.4	40.8	31.8
Nontenure Track	14.2	10.8	18.4	32.1
Behav/Soc Sci** Ph.D.s, F-T Acad	2,300	800	6,700	1,900
	%	%	%	%
Track Position	89.7	85.8	82.7	79.0
Tenured	60.4	58.6	49.2	42.8
Not Tenured	29.3	27.2	33.5	36.2
Nontenure Track	8.5	4.4	14.9	15.5

*Excludes those employed at university-operated federally funded R&D Centers.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Soc Sci = Psychology and other social sciences.

Note: Totals upon which percentages were based include those full-time academically employed whose tenure or track status was unknown, in addition to the above categories.

SOURCE: National Research Council.

Employment Status

As seen in Table 1.20, full-time or part-time employment status also has an effect on whether an individual is in a tenure-track position. In 1981, about 80 percent of the full-time academically employed 1973-1976 science and engineering Ph.D.s held tenure-track positions. In contrast, the majority (79 percent) of the part-time employed were in nontenure-track positions, with as little as 2 percent tenured in 1981. But, it should be noted, only 2 percent of the 1973-1976 science and engineering Ph.D.s in academe in 1981 were part-time employed.

TABLE 1.20 1981 Tenure Status of 1973-1976 Academically* Employed Science and Engineering Ph.D.s by Employment Status

Tenure Status	Total Empl	Full Time	Part Time
Total Academically Employed	30,100	29,500	600
	%	%	%
Track Position	78.2	79.5	9.7
[redacted]			
Nontenure Track	16.5	15.3	78.5
Not Tenured, Track Status Unknown	4.3	4.3	8.3
No Report	1.0	0.9	3.5

*Includes those employed full-time or part-time at colleges, medical schools, and universities, excluding university-operated federally funded R&D Centers.

SOURCE: National Research Council.

Plans at Ph.D.

Table 1.4 showed that life science Ph.D.s more frequently elect to pursue postdoctoral study immediately after the doctorate, whereas behavorial and social science Ph.D.s are much more likely to accept jobs immediately after graduation. Given the field differences in tenure status, it appears likely that these differences in postgraduation plans may have some relationship to the number of years for a science and engineering Ph.D. to attain a tenured position.

Evidence for this may be seen in Table 1.21. Among 1973-1976 science and engineering Ph.D.s academically employed in 1981, 59 percent of those having definite employment plans immediately after the doctorate were tenured in 1981, compared to only 32 percent of those who had been seeking employment at the time of Ph.D. and 16 percent of those with firm postgraduation commitments for postdoctoral study--individuals who delayed entering tenure-track positions. Also a smaller percentage of those with definite employment plans at graduation held nontenure-track positions (11 percent), compared to those with other postgraduation plans (20 percent for those who had been seeking employment and 26 percent for those having definite postdoctoral appointments).

TABLE 1.21 1981 Tenure Status of 1973-1976 Science and Engineering Ph.D.s Employed in Academe* by Plans at Ph.D.

1981 Tenure Status	Total All Plans**	Plans at Ph.D. Study Plans Definite	Study Plans Seeking	Employment Plans Definite	Employment Plans Seeking
Total Academically Employed	30,100	6,000	1,400	16,200	4,300
	%	%	%	%	%
Track Position	78.2	66.7	58.1	85.1	77.1
Tenured	43.5	16.3	25.0	59.1	31.6
Not Tenured	34.6	50.5	33.1	26.0	45.5
Nontenure Track	16.5	25.5	34.7	10.6	19.9
Not Tenured, Track Stat Unkn	4.3	6.3	6.9	3.7	1.6
No Report	1.0	1.5	0.3	0.5	1.4

*[illegible]s those employed full-time or part-time at colleges, medical [illegible], or universities, excluding those employed at university-operated federally funded R&D Centers.

**Includes individuals with other or unknown plans (N = 2,200).

SOURCE: National Research Council.

1977 Employer

As seen in Table 1.22, individuals in the 1973-1976 Ph.D. cohort who have remained at the same institution from 1977-1981 are more likely to be in tenure-track positions and to have attained a tenured position within eight years after receipt of the doctoral degree than those who have switched academic institutions. Slightly more than three-fourths of the 1973-1976 science and engineering Ph.D.s known to be academically employed in 1977 were still at the same institution in 1981; among these, 64 percent were tenured, and another 26 percent were in tenure-track positions. In contrast, the 1981 Survey revealed that only 19 percent of those employed at a different institution than in 1977 were tenured, and as many as 51 percent were in tenure-track positions but not yet tenured. On the other hand, only 7 percent of those employed at the same institution in 1981 as in 1977 were in nontenure-track positions, compared to as many as 26 percent of those who switched academic institutions. Clearly, science and engineering Ph.D.s who attain a tenure-track position and remain at the same academic institution for at least four years are much more successful in attaining a tenured position than are those who change academic institutions.

TABLE 1.22 1981 Tenure Status of 1973-1976 Science and Engineering Ph.D.s* by Whether Employed at Same Institution, 1977-1981

1981 Tenure Status	Same Institution	Different Institution
Total Academically Employed	14,000	4,000
	%	%
Track Position	89.7	69.9
Tenured	64.0	19.2
Not Tenured	25.7	50.8
Nontenure Track	6.9	25.6
Not Tenured, Track Status Unkn	3.2	4.2
No Report	0.1	0.3

*Includes those known to be employed full-time or part-time at colleges, medical schools, and universities in 1977 and 1981, excluding university-operated federally funded R&D Centers.

SOURCE: National Research Council.

ACADEMIC POSITION

Type of Institution

As with tenure status, rank distribution is dependent on the type of institution at which an individual is employed. Overall, among the 29,500 full-time academically employed science and engineering Ph.D.s who earned their degrees between 1973 and 1976, as many as 92 percent were in faculty positions, and only 7 percent held nonfaculty appointments in February 1981 (Table 1.23). Of the faculty members, only 7 percent were full professors while 42 percent were associate professors, and 39 percent were assistant professors. Instructors, administrators, and individuals in "other" faculty positions constituted the remaining small percentage of faculty.

Attaining the rank of full professor seems to be most difficult for those employed by medical schools/universities (5 percent, compared to 11 percent in 4-year colleges and 18 percent in 2-year colleges). As many as 8 percent of the Ph.D.s employed by medical schools/universities held nonfaculty positions. In 2- and 4-year colleges, only 3 percent of the Ph.D.s held nonfaculty positions.

By field, the highest percentage of 1973-1976 Ph.D.s with full professor rank was shown by those having EMP degrees and employed by 2-year colleges (27 percent). [The reader should note, however, that this percentage is based on a total of only 300 Ph.D.s.] Most 1973-1976 Ph.D.s, regardless of field or type of academic institution, were concentrated in the Associate and Assistant Professor ranks. With the exception of 2-year colleges, where 21 percent of the Ph.D.s were instructors, only small percentages of the Ph.D.s in 4-year colleges, universities, and medical schools held instructor, administrator, or "other" faculty positions.

TABLE 1.23 1981 Academic Position of Full-Time Employed 1973-1976 Science and Engineering Ph.D.s* by Type of Institution and Field of Doctorate

Type of Institution and Academic Position	Total S/E	Field of Doctorate: EMP Flds**	Life Sci**	Behav /Soc Sci**
Total F-T Acad. Empl	29,500	8,500	8,900	12,100
	%	%	%	%
Faculty	92.4	90.6	91.6	94.3
Professor	7.0	5.8	3.0	10.5
Assoc. Professor	41.4	46.3	35.5	42.2
Asst. Professor	39.0	35.1	47.8	35.4
Instructor	2.6	1.6	1.8	1.5
Administrator	1.7	0.5	1.4	1.6
Other Faculty	1.1	1.3	2.1	2.3
Nonfaculty Staff	6.9	8.8	7.2	5.5
No Report	0.6	0.7	1.2	0.2
2-Yr College	1,000	300	300	400
	%	%	%	%
Faculty	93.2	100.0	87.7	91.1
Professor	17.0	21.0	8.0	20.1
Assoc. Professor	31.6	37.8	31.1	27.4
Asst. Professor	31.5	36.7	40.2	27.5
Instructor	10.7	4.4	8.4	14.1
Administrator	2.5	0.0	0.0	2.0
Other Faculty	1.7	0.3	0.0	0.0
Nonfaculty Staff	3.3	0.0	0.0	8.1
No Report	3.4	0.0	12.3	0.0

*Includes those employed full-time at colleges, medical schools, or universities, excluding university-operated federally funded R&D Centers.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/ Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Soc Sci = Psychology and other social sciences.

Note: Vertical subtotals may not agree with Totals because of rounding.

SOURCE: National Research Council

TABLE 1.23 1981 Academic Position of Full-Time Employed 1973-1976 Science and Engineering Ph.D.s* by Type of Institution and Field of Doctorate (Continued)

Type of Institution and Academic Position	Total S/E	Field of Doctorate EMP Flds**	Life Sci**	Behav /Soc Sci**
4-Yr College	5,900	1,800	1,000	3,100
	%	%	%	%
Faculty	96.3	96.8	95.4	96.3
Professor	11.4	11.1	7.3	12.8
Assoc. Professor	48.0	52.9	40.3	47.5
Asst. Professor	33.1	30.9	40.6	32.1
Instructor	0.1	0.3	0.0	0.0
Administrator	0.9	0.2	1.2	1.2
Other Faculty	2.9	1.3	6.0	2.8
Nonfaculty Staff	3.3	2.5	4.6	3.3
No Report	0.4	0.7	0.0	0.3
Med Schools/Universities	22,600	6,300	7,700	8,600
	%	%	%	%
Faculty	91.4	88.4	91.3	93.7
Professor	5.4	3.2	2.4	9.7
Assoc. Professor	40.1	45.4	35.0	42.4
Asst. Professor	41.3	36.7	49.5	37.5
Instructor	1.1	1.1	1.4	0.9
Administrator	1.0	0.6	0.8	1.3
Other Faculty	1.9	1.3	2.2	1.9
Nonfaculty Staff	8.1	11.0	7.8	6.1
No Report	0.6	0.7	0.9	0.2

*Includes those employed full-time at colleges, medical schools, or universities, excluding university-operated federally funded R&D Centers.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Soc Sci = Psychology and other social sciences.

Note: Vertical subtotals may not agree with Totals because of rounding.

SOURCE: National Research Council.

Employment Status

The position held by an academically employed Ph.D. varies, depending on whether the individual is full-time or part-time employed (Table 1.24). Only 7 percent of the full-time employed science and engineering Ph.D.s held nonfaculty positions in 1981, compared to 23 percent of those who were employed part-time. Furthermore, among those in faculty positions, individuals employed part-time were much more likely to hold instructorships or other nonprofessorial positions (34 percent, compared to only 5 percent of the Ph.D.s employed full-time). In fact, only 7 percent of those Ph.D.s who were employed part-time in academe in 1981 held the ranks of full or associate professor, compared to almost half of those academically employed full-time.

TABLE 1.24 1981 Academic Position of 1973-1976 Science and Engineering Ph.D.s* by Employment Status

1981 Position	Total Employed	Full Time	Part Time
Total Academically Employed*	30,100	29,500	600
	%	%	%
Faculty	92.1	92.4	75.5
Nonfaculty	7.2	6.9	22.8
No Report	0.6	0.6	1.8

*Includes those employed full-time or part-time at colleges, universities, or medical schools, excluding university-operated federally funded R&D Centers.

SOURCE: National Research Council.

Ph.D. Year and Field Comparison

Approximately 12 percent of the 1977-1980 Ph.D.s employed full-time or part-time in academe in 1981 held positions at the full or associate professor level, compared to 48 percent of the 1973-1976 cohort and 80 percent of the 1969-1972 Ph.D.s (Table 1.25). There has also been a significant increase in the percentage of recent Ph.D.s who hold nonfaculty positions (11 percent of the 1977-1980 Ph.D.s, compared to only 2 percent each of the 1938-1958 [illegible] 1960-1964 Ph.D. cohorts).

TABLE 1.25 1981 Academic Position of 1938-1980 Science and Engineering Ph.D.s by Year of Doctorate

1981 Position	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Academic*	167,500	31,800	21,200	25,400	33,200	30,100	25,800
	%	%	%	%	%	%	%
Faculty	94.5	97.8	97.1	97.2	94.8	92.1	88.1
Professor	42.5	85.7	76.8	61.7	29.1	6.9	0.8
Assoc. Professor	27.0	7.7	15.4	29.3	51.3	40.9	10.8
Asst. Professor	20.2	0.5	1.6	3.6	10.1	39.0	67.2
Instructor	1.5	0.6	0.6	0.5	1.2	1.9	4.6
Other Faculty	3.3	3.3	2.6	2.1	3.2	3.5	4.7
Nonfaculty	4.8	1.7	2.3	2.5	4.4	7.2	11.0
No Report	0.6	0.5	0.6	0.3	0.8	0.6	1.0

*Includes those employed full-time and part-time at colleges, medical schools, and universities, excluding university-operated federally funded R&D Centers.

SOURCE: National Research Council.

Table 1.26 shows how the academic position of 1973-1976 science and engineering Ph.D.s is related to both field and year of doctorate. Overall, in 1981, 60 percent of the 1976 Ph.D.s were assistant professors, compared to only 21 percent of the 1973 Ph.D.s. Among the 1973-1976 Ph.D.s, promotions occurred not only from the assistant to the associate level but also from the associate to the full professor level; as many as 12 percent of the 1973 Ph.D.s were full professors in 1981, compared to only 3 percent of the 1976 Ph.D.s.

Compared to other science and engineering fields, 1973-1976 Ph.D.s in the behavorial and social sciences were somewhat more likely to hold faculty positions (94 percent, compared to 90 and 91 percent, respectively, of the life science and EMP Ph.D.s). Behavorial scientists appeared to receive promotions to the rank of full professor at a faster rate than did those in other fields: as many as 24 percent of the 1973 behavorial sciences Ph.D.s were full professors in 1981, whereas only 6 percent of the 1973 EMP Ph.D.s and 3 percent of the 1973 life scientists held this rank. In fact, it appears from comparing percentages at the higher ranks across fields and years, that life science Ph.D.s lag about one year behind other science and engineering fields in promotions to associate professorships--a typical market response to a generous supply.

TABLE 1.26 1981 Academic Position of 1973-1976 Science and Engineering Ph.D.s* by Field and Year of Doctorate

1981 Position	Total 1973-1976	Year of Doctorate 1973	1974	1975	1976
Total Academically Employed	30,100	7,800	7,900	7,200	7,200
	%	%	%	%	%
Faculty	92.1	92.4	93.5	90.3	92.0
Professor	6.9	12.2	10.0	1.5	3.1
Associate Professor	40.9	55.2	45.9	36.4	24.5
Assistant Professor	39.0	21.1	31.3	46.0	59.7
Instructor	1.9	2.0	1.5	2.2	2.0
Other Faculty	3.5	2.0	4.8	4.2	2.8
Nonfaculty	7.2	7.1	6.0	8.9	7.1
No Report	0.6	0.4	0.5	0.8	0.8
EMP Fields Ph.D.s	8,600	2,400	2,000	2,000	2,200
	%	%	%	%	%
Faculty	90.4	91.2	91.5	89.2	89.6
Professor	5.7	6.3	13.0	1.7	1.9
Associate Professor	45.6	62.7	47.5	44.9	25.7
Assistant Professor	35.1	19.6	25.6	37.1	59.1
Instructor	1.9	2.1	1.6	1.7	2.1
Other Faculty	2.2	0.5	3.8	3.8	0.9
Nonfaculty	9.0	8.4	8.3	9.4	9.8
No Report	0.6	0.4	0.2	1.4	0.6
Life Sciences Ph.D.s	9,000	2,300	2,500	2,200	2,000
	%	%	%	%	%
Faculty	91.3	90.4	95.1	88.2	90.9
Professor	3.9	3.3	3.0	2.8	2.9
Associate Professor	35.0	52.2	38.8	28.4	17.8
Assistant Professor	47.5	30.4	45.4	54.2	62.4
Instructor	2.0	1.7	2.7	0.8	2.8
Other Faculty	3.8	2.9	5.2	2.1	4.9
Nonfaculty	7.6	8.6	4.1	10.8	7.2
No Report	1.1	1.0	0.8	1.0	2.0
Behav/Soc Sci Ph.D.s	12,400	3,000	3,400	3,000	3,000
	%	%	%	%	%
Faculty	93.9	95.0	93.5	92.6	94.6
Professor	10.6	23.7	13.3	0.5	4.2
Associate Professor	42.0	51.4	50.1	36.6	28.2
Assistant Professor	35.4	15.2	24.4	45.9	58.2
Instructor	1.9	2.1	0.7	3.5	1.3
Other Faculty	4.1	2.5	5.0	6.1	2.7
Nonfaculty	5.8	5.0	5.9	7.1	5.2
No Report	0.3	0.0	0.6	0.3	0.2

*Includes those employed full-time and part-time at colleges, medical schools, and universities, excluding university-operated federally funded R&D Centers.

EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Social Sci = Psychology and other social sciences.

SOURCE: National Research Council.

Postgraduation Plans

The different promotion rates by field of doctorate can also be tied to the postgraduation plans of science and engineering Ph.D.s. As seen in Table 1.27, the decision to continue study immediately after the doctorate, rather than to accept or to seek employment, has an impact not only on tenure status but also on academic position. Among Ph.D.s who were employed in academe full-time or part-time in 1981, over 60 percent of those with definite plans for employment immediately after Ph.D. receipt held the rank of full or associate professor, compared to only 37 percent of those still seeking employment at Ph.D. and 22 percent of those with definite plans for postdoctoral study. In contrast, as many as 13 percent of those with definite postdoctoral study plans were employed in nonfaculty positions in 1981 compared to only 4 percent of those Ph.D.s who had jobs immediately after graduation.

It should be noted, however, that this does not take into account the different institutional distributions, i.e., individuals planning to teach in lower-ranking institutions may not need additional postdoctoral study, while those who want to do research at the more prestigious schools often must have a few years of postdoctoral study and may face tougher competition once employed.

TABLE 1.27 1981 Academic Position of 1973-1976 Science and Engineering Ph.D.s* by Plans at Ph.D.

1981 Position	Total All Plans**	Plans at Ph.D.			
		Study Plans		Employment Plans	
		Definite	Seeking	Definite	Seeking
Total Academic*	30,100	6,000	1,400	16,200	4,300
	%	%	%	%	%
Faculty	92.1	85.9	84.9	95.2	92.7
Professor	6.9	0.9	0.0	10.4	5.6
Assoc. Professor	40.9	21.5	27.4	51.1	31.7
Asst. Professor	39.0	59.8	51.5	28.8	46.5
Instructor	1.9	1.8	4.4	1.6	4.0
Other Faculty	3.6	2.4	1.6	3.4	4.8
Nonfaculty	7.2	13.1	14.8	4.2	6.8
No Report	0.6	1.0	0.3	0.6	0.5

*Includes those employed full-time and part-time at colleges, medical schools, and universities, excluding those at university-operated federally funded R&D Centers.

**Includes individuals who had other/unknown plans (N = 2,200)

SOURCE: National Research Council

Longitudinal Analyses

Longitudinal analysis of the academic rank status of recent Ph.D.s provides additional insight into the situation that they face in academe. Table 1.28 provides data on the academic positions of Ph.D.s 5-8 years after receipt of their doctoral degrees. The 1981 data is for Ph.D.s who graduated between 1973 and 1976, 1979 data for graduates between 1971 and 1974, 1977 data for 1969-1972 Ph.D.s, and 1975 data for 1967-1971 Ph.D.s.

For all science and engineering fields combined, the percentage of Ph.D.s who held the ranks of full or associate professor 5-8 years after receipt of their degrees has decreased since 1975 (62 percent in 1975 and 47 percent in 1981). Conversely, the percentage at the rank of assistant professor has increased from 30 percent in 1975 to 39 percent in 1981.

By field, in 1975 as many as 12 percent of the EMP graduates 5-8 years past receipt of their Ph.D. held the rank of full professor, whereas in 1981 only 6 percent of the 1973-1976 EMP Ph.D.s held such rank. Similar decreases over time in the percentage of Ph.D.s holding the rank of associate professor were noted for Ph.D.s in the behavorial and social sciences (58 percent in 1975 and 42 percent in 1981).

It seems clear that the climb up the academic ladder has slowed over the years. Further evidence of this is the fact that all science and engineering fields showed an increase between 1975 and 1981 in the percentage of Ph.D.s in the rank of assistant professor 5-8 years after the doctorate. Academic institutions appear to retain individuals in lower ranks due to increased competition for such ranks, projected declining student enrollment, and the resulting reduction in the number of new faculty positions.

TABLE 1.28 Academic Position of Science and Engineering Ph.D.s* 5-8 Years After the Doctorate (1975-1981)

Field of Doctorate and Academic Position	1975 1967-70 Ph.D.s	1977 1969-72 Ph.D.s	1979 1971-74 Ph.D.s	1981 1973-76 Ph.D.s
Total Acad. Empl	31,000	34,600	31,900	30,100
	%	%	%	%
Professor	11.2	9.0	8.8	6.9
Assoc. Professor	51.0	47.2	42.5	40.9
Asst. Professor	30.3	34.0	35.7	39.0
Instructor	0.8	1.7	1.4	1.9
Other/No Report	6.7	8.1	11.6	11.3
EMP** Ph.D.s	13,100	12,900	10,400	8,600
	%	%	%	%
Professor	12.2	8.2	8.0	5.6
Assoc. Professor	50.9	45.7	44.4	45.6
Asst. Professor	29.0	34.0	34.6	35.1
Instructor	0.8	2.3	1.1	1.9
Other/No Report	7.1	9.8	11.9	11.7
Life Sciences** Ph.D.s	8,600	10,000	9,800	9,000
	%	%	%	%
Professor	8.2	7.4	6.7	3.0
Assoc. Professor	43.3	39.6	34.4	35.0
Asst. Professor	40.9	41.6	43.3	47.5
Instructor	1.2	2.4	2.3	2.0
Other/No Report	6.4	9.0	13.3	12.5
Behav/Social Sci** Ph.D.s	9,300	11,700	11,700	12,400
	%	%	%	%
Professor	12.7	11.2	11.3	10.6
Assoc. Professor	58.3	55.3	47.7	42.0
Asst. Professor	22.1	17.5	30.5	35.4
Instructor	0.4	0.4	0.8	1.9
Other/No Report	6.5	5.5	9.8	10.2

*Includes those employed full-time or part-time at colleges, medical schools, and universities, excluding university-operated federally funded R&D Centers.

**EMP = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/Environmental Sciences; Life Sciences = Agricultural Sciences, Medical Sciences, and Biological Sciences; Behav/Social Sci = Psychology and other social sciences.

SOURCE: National Research Council.

1977 Employer

Among science and engineering Ph.D.s academically employed in 1981, almost all--97 percent--who were employed at the same institution in 1981 as in 1977 held faculty positions in 1981, compared to 91 percent of those who switched academic institutions (Table 1.29). Individuals who stayed at the same institution also received promotions to the full and associate professor ranks at a faster rate; nearly two-thirds of the faculty members at the same institution in 1977 and 1981 held full or associate professorships, compared to only slightly more than one-third of those who were at different institutions. Again, it is clear that individuals who can obtain faculty positions immediately after the doctorate and remain at the same institution 5-8 years are much more successful at being promoted than those who change academic institutions.

TABLE 1.29 1981 Academic Position of 1973-1976 Science and Engineering Ph.D.s by Whether Employed at Same Institution, 1977-1981

1981 Position	Same Institution	Different Institution
Total Academe*	14,000	4,000
	%	%
Faculty	97.0	91.3
Nonfaculty	2.5	8.6
No Report	0.6	0.2

*Includes only those known to be employed full-time or part time at colleges, medical schools, and universities in 1977 and 1981, excluding university-operated federally funded R&D Centers.

SOURCE: National Research Council.

Chapter II

HUMANITIES

1981 DOCTORAL POPULATION

Of the approximately 76,000 humanities doctorate recipients in the United States in 1981, over 57 percent earned their doctoral degrees between 1970 and 1980 (Table 2.1). As was true for the sciences, the number of humanities doctoral degrees awarded during the past 21 years showed a rapid rate of increase. The percentage who earned their doctoral degrees during the 1960s (25 percent) was double the percentage earned during the previous decade (12 percent). Furthermore, the representation of the 1970-1980 humanities Ph.D. graduates (57 percent) was double that of the 1960s. However, the production of humanities doctorates has declined during the 1970s.

TABLE 2.1 Humanities Ph.D.s in the United States in 1981 by Field and Year of Doctorate

Field of Doctorate	Total	Year of Doctorate 1938-1949	1950-1959	1960-1969	1970-1980	1973-1976	1977-1980
	N	%	%	%	%	%	%
All Fields	76,000	5.5	11.9	25.3	57.4	[illegible]	[illegible]
History	20,300	6.2	13.3	25.9	54.6	[illegible]	[illegible]
Art History	2,100	3.3	10.0	19.5	67.2	[illegible]	[illegible]
Music	5,100	2.0	10.3	20.2	67.5	[illegible]	[illegible]
Speech/Theater	3,300	3.6	12.9	33.1	50.4	[illegible]	[illegible]
Philosophy	6,100	5.5	12.6	26.5	55.4	[illegible]	[illegible]
Other Humanities*	2,000	2.0	5.6	26.3	66.1	[illegible]	[illegible]
Engl/Amer Lang & Lit	21,300	5.8	12.1	26.0	56.1	[illegible]	[illegible]
Classical Lang & Lit	1,800	12.8	11.8	29.4	46.1	[illegible]	[illegible]
Modern Lang & Lit	14,100	5.6	10.8	23.0	60.7	[illegible]	[illegible]

**Other Humanities* includes library and archival sciences, general humanities, and any other humanities fields not listed above.

SOURCE: National Research Council.

Field of Ph.D.

Compared to production in past decades, the fastest-growing humanities fields during the 1970-1980 period were music, art history, and "other" humanities: approximately two-thirds of the individuals in those fields earned their doctoral degrees during that period. In contrast, the slowest rate of growth occurred for the fields of classical languages/literature and speech/theater (46 and 50 percent, respectively, earned their doctorates between 1970 and 1980). It should be noted, however, that--with the exception of music--the production of humanities doctorates has declined during the 1970s; and in fact, the increase in music doctorates may be attributed to the introduction of Doctor of Musical Arts degrees in the 1970s, rather than an increase in musicology Ph.D.s.

Sex

While the percentage of men who earned humanities Ph.D. degrees from 1970 to 1980 (53 percent) was nearly double that of the 1960s (28 percent), the percentage of female humanities Ph.D.s who earned their doctorates during that time was more than three times the percentage of those who earned degrees in the 1960s--70 percent and 19 percent, respectively (Table 2.2).

Although the decline was less for women, the number of both men and women awarded doctoral degrees in the fields of philosophy, "other" humanities, and all languages and literature showed a decline after the early 1970s. In contrast, in the fields of history, art history, and speech/theater, while the number of male humanities doctorates declined during the last four years, Ph.D. awards to women continued to increase. It should be noted that the number of awarded music doctoral degrees (including D.M.A.s) continued to increase throughout the 1970s for both men and women.

TABLE 2.2 Humanities Ph.D.s in the United States in 1981 by Sex, Field, and Year of Doctorate

Sex and Field of Doctorate	Total	Year of Doctorate 1938-1949	1950-1959	1960-1969	1970-1980	1973-1976	1977-1980
	N	%	%	%	%	%	%
Men, Total	55,400	5.8	13.9	27.8	52.5	21.3	15.7
History	17,000	6.1	14.5	27.5	51.9	21.2	14.5
Art History	1,100	3.7	14.2	21.9	60.2	26.6	19.5
Music	4,100	2.2	11.7	21.2	64.8	25.5	27.6
Speech/Theater	2,500	3.3	13.4	35.7	47.7	15.0	14.4
Philosophy	5,300	5.5	13.4	26.9	54.2	22.1	16.2
Other Humanities*	1,300	1.4	6.5	33.6	58.4	22.9	19.8
Engl/Amer Lang & Lit	14,300	6.6	14.9	29.2	49.3	20.6	13.6
Classical Lang & Lit	1,200	11.1	11.6	33.9	43.4	17.2	10.8
Modern Lang & Lit	8,500	6.8	14.2	26.1	52.9	21.8	15.3
Women, Total	20,600	4.5	6.4	18.7	70.4	28.3	27.3
History	3,300	6.5	7.2	17.6	68.6	27.1	28.9
Art History	900	2.8	5.2	16.8	75.2	27.4	33.9
Music	1,000	1.0	4.4	16.2	78.4	27.3	41.1
Speech/Theater	700	4.5	11.4	24.2	59.9	21.9	24.5
Philosophy	900	5.4	7.8	24.5	62.3	26.9	23.2
Other Humanities*	700	3.0	3.7	12.2	81.1	36.0	27.6
Engl/Amer Lang & Lit	6,900	4.1	6.3	19.4	70.3	28.4	24.7
Classical Lang & Lit	500	16.6	12.3	18.9	52.1	20.9	14.6
Modern Lang & Lit	5,700	3.7	5.7	18.3	72.4	30.1	28.1

*"Other Humanities" includes library and archival sciences, general humanities, and any other humanities fields not given above.

SOURCE: National Research Council.

Racial/Ethnic Identification

Racial/ethnic minority group members comprised 6 percent of the total 1981 humanities Ph.D. population, of which approximately half were Hispanic. As was true for the science and engineering fields, the humanities showed a rapid increase in the number of racial/ethnic minority group members earning Ph.D.s between 1970 and 1980 (Table 2.3). Over 70 percent of the Black, Hispanic, and American Indian/Alaskan Native Ph.D.s and almost 65 percent of the Asians/Pacific Islanders--compared to only 57 percent of the Whites--earned their degrees during this time frame.

TABLE 2.3 Humanities Ph.D.s in the United States in 1981 by Year of Doctorate and Race/Ethnic Identification

Racial/Ethnic Identification		Total 1938-1980	Year of Doctorate 1938-1949	1950-1959	1960-1969	1970-1980	1973-1976	1977-1980
Total, All Groups	N	76,000	4,100	9,100	19,200	43,600	17,700	14,300
	%	100.0	5.5	11.9	25.3	57.4	23.2	18.8
White	N	70,000	3,000	8,300	17,900	39,900	16,200	12,600
	%	100.0	5.5	11.9	25.5	57.0	23.2	18.3
Minorities Total	N	4,400	100	500	700	3,200	1,400	1,300
	%	100.0	1.7	10.2	16.0	72.0	30.7	29.5
Hispanic	N	2,100	*	200	400	1,600	700	800
	%	100.0	0.3	7.7	18.3	73.7	33.1	38.5
Black	N	1,100	*	200	100	800	300	400
	%	100.0	4.0	14.4	10.7	70.8	28.5	35.7
Asian/Pacific Islander	N	800	*	100	200	500	300	200
	%	100.0	2.4	11.1	21.7	64.8	35.7	25.7
Amer Indian/ Alk Native	N	400	*	*	*	300	100	100
	%	100.0	0.5	9.8	7.4	82.3	29.5	27.4
No Report	N	1,600	200	300	600	500	100	200
	%	100.0	13.2	16.9	40.5	29.3	3.8	11.4

*Population less than 100.

SOURCE: National Research Council.

TABLE 2.4 Postgraduation Plans of 1960-1980 Humanities Ph.D.s in the United States by Year and Field of Doctorate

Field of Doctorate and Plans at Ph.D.	Total 1960-1980	Year of Doctorate 1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Humanities	62,800	6,600	9,300	15,000	17,700	14,300
	%	%	%	%	%	%
Postdoc Study Total	3.2	2.5	1.6	3.5	3.1	4.4
Definite	2.0	2.4	1.5	2.4	1.6	2.3
Seeking	1.2	0.0	0.1	1.2	1.5	2.2
Employment Total	90.1	92.0	93.1	91.4	89.3	87.0
Definite	71.2	83.6	86.7	78.1	62.8	58.7
Seeking	18.9	8.4	6.3	13.3	26.5	28.2
Other/Unknown Plans	6.7	5.6	5.4	5.0	7.6	8.6
Engl/Amer Lit	17,500	1,700	2,900	4,300	5,000	3,700
	%	%	%	%	%	%
Postdoc Study Total	3.2	2.8	1.9	4.2	2.9	3.3
Employment Total	91.2	90.6	94.7	91.8	90.6	88.5
Definite	72.4	79.9	90.4	81.6	59.5	61.0
Seeking	18.8	10.6	4.3	10.3	31.1	27.5
Other/Unknown Plans	5.7	6.7	3.3	3.9	6.4	8.2
Other Languages*	13,200	1,200	1,900	3,100	3,900	3,100
	%	%	%	%	%	%
Postdoc Study Total	3.4	3.1	0.4	2.3	3.3	6.8
Employment Total	88.8	92.5	92.2	92.0	86.0	85.8
Definite	66.9	86.5	82.4	77.0	59.2	49.5
Seeking	21.9	6.0	9.8	15.0	26.8	36.3
Other/Unknown Plans	7.7	4.4	7.4	5.7	10.8	7.4
History	16,300	1,900	2,200	4,300	4,500	3,400
	%	%	%	%	%	%
Postdoc Study Total	3.0	2.4	2.5	2.8	3.4	3.4
Employment Total	89.8	91.2	89.9	94.1	89.8	83.7
Definite	72.9	82.7	84.9	79.9	65.5	60.5
Seeking	16.9	8.5	4.9	14.2	24.3	23.2
Other/Unknown Plans	7.1	6.3	7.6	3.1	6.8	12.9
Philosophy	5,000	700	800	1,100	1,400	1,100
	%	%	%	%	%	%
Postdoc Study Total	2.9	0.6	0.0	4.5	3.4	4.2
Employment Total	90.5	90.5	95.4	86.9	89.9	91.0
Definite	72.7	82.7	87.2	73.0	64.7	65.3
Seeking	17.8	7.7	8.2	14.0	25.2	25.6
Other/Unknown Plans	6.7	8.9	4.6	8.5	6.7	4.8
Other Humanities*	10,800	1,200	1,400	2,200	2,900	3,100
	%	%	%	%	%	%
Postdoc Study Total	3.5	2.5	1.8	4.9	2.5	4.6
Employment Total	90.2	95.3	94.5	86.7	90.5	88.5
Definite	71.5	87.7	87.6	71.8	67.9	61.3
Seeking	18.7	7.6	6.9	14.9	22.6	27.3
Other/Unknown Plans	6.3	2.2	3.7	8.4	7.0	6.9

**"Other languages" are classical and modern foreign languages and literature; "Other humanities" include art history, speech/theater, music, library sciences, general humanities, and any other humanities fields not given above.

Note: Vertical and horizontal subtotals may not agree with Totals because of rounding.

SOURCE: National Research Council.

Postgraduation Plans

Traditionally, postdoctoral appointments have played a minor role in the postgraduation plans of humanities Ph.D.s. Only 3 percent of the 1973-1976 Ph.D.s were considering postdoctoral study, and of these, approximately half were still seeking a postdoctoral appointment at the time of their graduation (Table 2.4). There was little variation by year of Ph.D.; however, the 1977-1980 Ph.D.s had the highest percentage of Ph.D.s planning postdoctoral study (7 percent in "other" languages; 5 percent in "other" humanities; 4 percent in philosophy; and 3 percent each in history and English/American literature). It should be noted, however, that the percentage who were still seeking postdoctoral study constituted, in several fields, almost half of those with plans for postdoctoral study.

For all humanities fields there has been a steady decline in the percentage of humanities doctorate recipients who had firm job prospects at the time they received their doctoral degrees since the mid-1960s. Approximately 87 percent of the 1965-1968 humanities Ph.D.s had firm job commitments when they graduated, compared to only 63 percent of the 1973-1976 graduates and 59 percent of the 1977-1980 Ph.D.s. The largest percentage decrease was reported by Ph.D.s with degrees in languages other than English: 87 percent of the 1960-1964 recipients had jobs when they graduated, compared to only 59 percent of the 1973-1976 group and 50 percent of the 1977-1980 cohort.

Summary

As seen by the continuing decrease in the percentage of humanities Ph.D. recipients with firm job commitments immediately after receiving their doctorate, the job market for humanities doctorates has not been able to keep pace with the large increase in the production of new doctorates in the 1970s. The following sections examine the employment status of the 1973-1976 Ph.D.s and compares these graduates with those from other Ph.D. years in terms of type of employer, academic rank, and tenure status.

EMPLOYMENT STATUS OF 1973-1976 PH.D.S

The employment picture for the 1973-1976 humanities doctorate recipients is not as bright as it was for those in the science and engineering fields. As shown in Table 2.5, only the field of history had over 90 percent of its doctorate recipients in full-time employment in 1981 (91 percent). The percentage of humanists holding part-time positions ranged from 9 percent for those in "other" humanities to 4 percent for those in history. Only about 1 percent of the humanists in the various fields held postdoctoral appointments.

Although an average of 2 percent of the 1973-1976 humanities doctorates were unemployed but seeking employment, this employment status varied by field. Over 3 percent of the Ph.D.s with degrees in "other" languages were seeking employment. In contrast, Ph.D.s in philosophy had the lowest percentage of those unemployed but seeking employment (0.4 percent). However, for philosophy Ph.D.s, three-fourths of the 5 percent employed part-time were seeking full-time employment. Furthermore, more than 4 percent of the Ph.D.s in philosophy had dropped out of the labor force.

When employment data are presented by sex, differences in employment status surface. Far greater female Ph.D.s in the humanities were part-time employed than men (12 percent, compared to 4 percent). With the exception of Ph.D.s in philosophy, less than 80 percent of the 1973-1976 female humanists were employed in full-time jobs in 1981. It should also be noted that as many as 6 percent of female humanists had dropped out of the labor force by 1981, compared to less than 1 percent of the men.

TABLE 2.5 1981 Employment Status of 1973-1976 Humanities Ph.D.s by Sex and Field of Doctorate

Sex and Employment Status	Total	Field of Doctorate: English	Other Languages*	History	Philosophy	Other Humanities*
Both Sexes	17,700	5,000	3,900	4,500	1,400	2,900
	%	%	%	%	%	%
Full-time Employed	87.5	87.4	84.9	90.5	89.2	85.9
Part-time Employed	6.5	6.7	7.4	4.4	4.9	9.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Postdoctoral Appt	0.8	0.7	0.8	1.0	0.9	0.8
Unemployed, Seeking Empl	2.2	2.4	3.3	1.8	0.4	1.6
Not in Labor Force	2.4	2.7	3.2	1.4	4.2	1.5
No Report	0.5	0.0	0.4	0.8	0.4	1.0
Men	11,900	3,000	2,100	3,600	1,200	2,000
	%	%	%	%	%	%
Full-time Employed	92.2	93.1	91.0	93.9	90.4	90.0
Part-time Employed	3.8	3.4	3.7	2.3	4.0	7.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Postdoctoral Appt	0.8	0.8	1.1	0.8	0.8	0.4
Unemployed, Seeking Empl	1.9	2.3	3.5	1.6	0.3	1.0
Not in Labor Force	0.7	0.4	0.2	0.4	4.0	0.2
No Report	0.6	0.0	0.4	1.1	0.4	1.1
Women	5,800	2,000	1,800	900	200	900
	%	%	%	%	%	%
Full-time Employed	78.2	78.8	77.9	77.0	82.9	77.2
Part-time Employed	12.1	11.8	11.7	12.9	9.8	13.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Postdoctoral Appt	1.0	0.5	0.6	1.9	1.7	1.7
Unemployed, Seeking Empl	2.7	2.6	3.0	2.6	0.4	2.9
Not in Labor Force	5.9	6.3	6.5	5.6	5.1	4.2
No Report	0.3	0.0	0.4	0.0	0.0	0.9

*"Other languages" are classical and modern foreign languages and literature; "Other humanities" include art history, speech/theater, music, library sciences, general humanities, and any other humanities fields not given above.

SOURCE: National Research Council.

Postgraduation Plans

Those 1973-1976 humanities Ph.D.s with firm employment plans immediately after the doctorate had a higher percentage of full-time employment in 1981 than did those who were still seeking employment at the time of Ph.D. receipt--93 percent compared to 80 percent (Table 2.6). Those who had been seeking employment at the time of graduation were much more likely to be part-time employed (13 percent) or unemployed and seeking employment (4 percent) as of 1981 than those with firm postgraduation job commitments.

TABLE 2.6 1981 Employment Status of 1973-1976 Humanities Ph.D.s by Plans at Ph.D.

1981 Employment Status	Plans at Ph.D.	
	Definite Employment	Seeking Employment
Total	11,100	4,700
	%	%
Full-time Employed	92.7	79.8
Part-time Employed	2.8	13.1
Seeking F-T Empl	0.9	4.9
Not Seeking/No Rpt	1.9	8.2
Postdoctoral Appt	1.1	0.3
Unemployed, Seeking Empl	1.1	4.2
Not in Labor Force	1.7	2.3
No Report	0.6	0.4

SOURCE: National Research Council.

Comparisons to Other Ph.D. Year Cohorts

For Ph.D.s who earned their degrees after the early 1960s, there is a direct relationship between the number of years since receiving their doctorates and their 1981 employment status (full-time versus part-time). The more years these Ph.D.s are in the doctoral labor pool, the greater their chances of being full-time employed (Table 2.7). About 93 percent of the 1965-1968 humanities Ph.D.s were employed full-time in 1981--compared to 90 percent of the 1969-1972 graduates, 88 percent of the 1973-1976 group, and 83 percent of the 1977-1980 group. The tighter job market encountered by individuals receiving humanities doctoral degrees within the last eight years, as well as the saturation of tenured academic positions, is also reflected by the increase in the percentage of Ph.D.s who were employed part-time but seeking full-time jobs (5 percent of the 1977-1980 Ph.D.s, compared to about 1 percent of the pre-1973 graduates).

Although similar findings are seen for men when the 1938-1980 Ph.D.s are analyzed by sex, the bleak situation for women is clearly obvious. Across all Ph.D. year groups, with the one exception of the 1965-1968 graduates, less than 80 percent of women Ph.D.s were employed in full-time jobs, and more than 10 percent were in part-time positions. In addition, almost 10 percent of the female humanists who received their doctoral degrees since 1969 were not even employed in 1981.

TABLE 2.7 1981 Employment Status of 1938-1980 Humanities Ph.D.s by Sex and Year of Doctorate

Sex and Employment Status	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Both Sexes	76,000	13,200	6,600	9,300	15,000	17,700	14,300
	%	%	%	%	%	%	%
Full-time Employed	83.6	61.7	88.6	93.0	90.3	87.5	83.4
Part-time Employed	6.0	7.3	3.0	4.1	4.5	6.5	8.2
[redacted]							
Postdoctoral Appt	0.7	0.4	0.5	0.5	0.8	0.8	1.0
Unemployed, Seeking Empl	1.4	0.2	0.6	0.4	1.5	2.2	2.5
Not in Labor Force	7.8	29.3	7.0	1.8	2.4	2.4	4.3
No Report	0.6	1.1	0.2	0.3	0.6	0.5	0.5
Men	55,400	10,900	5,300	7,300	11,300	11,900	8,700
	%	%	%	%	%	%	%
Full-time Employed	87.1	65.3	92.1	94.8	94.5	92.2	88.6
Part-time Employed	3.7	6.1	1.3	3.0	2.0	3.8	4.9
[redacted]							
Postdoctoral Appt	0.5	0.3	0.5	0.4	0.5	0.8	0.7
Unemployed, Seeking Empl	1.1	0.1	0.4	0.2	1.0	1.9	2.2
Not in Labor Force	6.9	27.0	5.4	1.4	1.4	0.7	2.8
No Report	0.7	1.2	0.3	0.3	0.5	0.6	0.8
Women	20,600	2,300	1,300	1,900	3,700	5,800	5,600
	%	%	%	%	%	%	%
Full-time Employed	74.1	44.3	73.6	86.4	77.4	78.2	75.5
Part-time Employed	12.1	13.3	10.6	8.2	12.1	12.1	13.3
[redacted]							
Postdoctoral Appt	1.1	0.8	0.4	0.8	1.5	1.0	1.5
Unemployed, Seeking Empl	2.3	0.6	1.6	1.0	2.8	2.7	3.0
Not in Labor Force	10.0	40.6	13.7	3.5	5.5	5.9	6.5
No Report	0.3	0.5	0.1	0.2	0.6	0.3	0.2

Note: Vertical and horizontal subtotals may not agree with Totals because of rounding.

SOURCE: National Research Council.

FIELD MOBILITY

Mobility from doctorate specialty to 1981 employment field for employed 1973-1976 humanities Ph.D.s is shown in Table 2.8. Music and art history graduates were most likely to be employed in their doctoral specialty in 1981 (89 and 84 percent, respectively), in contrast to Ph.D.s in "other" humanities and history (51 and 57 percent, respectively). Among the history Ph.D.s, almost 11 percent were employed in the behavorial and social sciences fields and another 8 percent both in "other" humanities (which includes library sciences) and professional fields. Philosophy Ph.D.s had the highest percentage--nearly 5 percent--employed in the EMP (Engineering, Math, and Physical Sciences) fields; whereas about 7 percent of the speech/theater Ph.D.s held jobs in education and another 7 percent were employed in behavorial and social sciences (which includes communications).

TABLE 2.8 Field Mobility of 1973-1976 Humanities Ph.D.s:* Doctoral Specialty to 1981 Employment Specialty

	Field of Doctorate									
Field of Employment**	All Fields	History	Art History	Music	Speech/Theater	Philosophy	Other Humanities**	Eng/Amer Lang&Lit	Classical Lang&Lit	Modern Lang&Lit
Total Employed	16,600	4,300	500	1,300	500	1,300	500	4,600	300	3,300
	%	%	%	%	%	%	%	%	%	%
History	15.0	[redacted]	0.4	0.0	0.0	0.0	0.4	0.7	1.3	0.2
Art History	2.9	0.3	[redacted]	0.0	0.0	0.4	4.8	0.3	0.0	0.1
Music	7.1	0.3	0.0	[redacted]	0.0	0.0	0.0	0.0	0.0	0.4
Speech/Theatre	2.1	0.0	0.0	0.0	[redacted]	0.0	0.2	0.0	0.0	0.2
Philosophy	5.6	0.1	0.0	0.0	0.0	[redacted]	0.0	0.0	1.0	0.4
Other Humanities**	5.8	8.2	4.0	3.7	3.4	2.1	[redacted]	3.3	3.3	2.7
Engl/Amer Lang&Lit	20.2	1.0	0.0	0.3	2.3	0.7	2.8	[redacted]	[redacted]	3.4
Classical Lang&Lit	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	[redacted]	0.6
Modern Lang&Lit	14.6	[redacted]	0.0	0.0	0.8	0.5	9.9	1.2	[redacted]	[redacted]
EMP Fields**	1.9	0.4	0.0	0.6	1.5	4.6	2.4	2.8	[redacted]	2.0
Life Sciences**	0.8	1.4	0.0	0.0	0.4	1.4	0.0	1.0	0.7	0.3
Behav/Soc Sciences**	5.0	10.7	0.0	0.0	7.2	5.1	4.6	3.2	5.2	2.5
Education	3.7	2.7	0.6	0.5	6.8	3.6	5.4	5.6	3.6	3.6
Professional Fields	6.0	7.9	4.6	3.1	3.0	7.1	11.3	6.4	8.8	3.4
Other/No Report	7.8	9.7	6.2	2.6	8.3	4.9	6.8	7.3	5.5	10.0

* Includes full-time and part-time employed individuals only.

** See the Specialties List in Appendix A for list of fine fields included under each broad field. "Other Humanities" includes the fine fields of library/archival sciences, general humanities, and any other humanities fields not listed above.

EMP Fields = Engineering, Mathematics, Computer Sciences, Chemistry, Physics/Astronomy, and Earth/ Environmental Sciences. "Life Sciences" = Agricultural Sciences, Medical Sciences, and Biological Sciences. "Behavorial/Social Sciences" = Psychology and other Social Sciences.

SOURCE: National Research Council.

As seen from Table 2.9, when those employed in academic (colleges and universities) and nonacademic settings are compared separately, music and art history Ph.D.s continued to have the highest incidences of employment in their doctoral specialty. For Ph.D.s in music, 93 percent of those employed in academe and 82 percent of those employed in nonacademic settings were employed in the field of music. Among art history Ph.D.s, about 91 percent of those academically employed were working in art history, compared to only 56 percent of those in nonacademic job settings. In contrast, among all other humanities fields, approximately one-third or less of those working in nonacademic job settings were able to secure employment in their doctoral specialty, compared to approximately 60 percent or more of those employed at academic institutions.

TABLE 2.9 Percentage of 1973-1976 Humanities Ph.D.s Employed in Doctoral Specialty Area by Academic/Nonacademic* Employment Sector, 1981

Field of Doctorate	Academic		Nonacademic	
	Total Empl (N)	Empl in Ph.D. Field (%)	Total Empl (N)	Empl in Ph.D. Field (%)
History	2,900	73.3	1,400	25.0
Art History	400	91.4	100	56.0
Music	1,000	93.1	300	82.0
Speech/Theater	400	73.9	100	26.2
Philosophy	1,100	84.0	200	4.6
Other Humanities**	400	59.7	100	25.0
Engl/Amer Lang&Lit	3,800	80.6	800	14.3
Classical Lang&Lit	200	76.3	100	36.7
Modern Lang&Lit	2,700	81.4	600	21.7

*Academic settings include 2-year colleges, 4-year colleges, medical schools, and universities. Nonacademic settings include elementary/secondary schools, business/ industry, self-employment, government (U.S., state, local), hospital/clinics, private foundations, other nonprofit organizations, and other employers excluding academe.

**"Other humanities" includes library/archival sciences, general humanities, and any other humanities fields not listed above.

SOURCE: National Research Council.

The reasons given by Ph.D.s for being employed in areas other than their doctoral specialty fields provide an indication of the state of the job market as seen by recent humanities doctorate recipients. About half of the employed 1973-1976 humanities Ph.D.s not working in their doctoral specialties were in other fields because positions in their specialty areas were not available (Table 2.10). Comparing fields of doctorate, almost 60 percent of the Ph.D.s in languages other than English cited lack of positions in their field as the reason for employment in another field, compared to 40 percent of philosophy Ph.D.s working outside their doctoral specialties. Another reason given by a large percentage (30 percent) of the humanities doctorates for accepting a job outside their specialty areas was that the career options were more attractive in another area. In addition, 10 percent of the philosophy Ph.D.s not working in their doctoral specialty indicated that they were promoted out of their Ph.D. field and almost 20 percent gave other reasons.

TABLE 2.10 Reasons Given by 1973-1976 Humanities Ph.D.s for Being Employed Outside Their Ph.D. Field in 1981 by Field of Doctorate

		Field of Doctorate				
Reasons Empl Outside Ph.D. Fld	Total	English	Other Languages*	History	Philosophy	Other Humanities*
Total Reporting Reason**	3,400	1,000	700	1,200	300	300
	%	%	%	%	%	%
Better Pay	2.7	4.6	2.9	0.4	4.5	2.6
More Attractive Career Options	29.8	37.3	25.4	30.0	23.0	22.1
Preferred Geographic Location	1.7	0.8	3.2	0.6	2.7	4.4
Family/Marital Status Constraints	3.1	3.4	2.0	4.2	0.0	4.1
Position in Ph.D. Fld Not Available	50.2	44.0	59.3	53.3	39.7	48.7
Promoted Out of Ph.D. Field	3.0	3.6	1.0	1.1	10.1	5.9
Other	7.3	6.3	3.1	7.6	19.4	5.2
Multiple Reasons	2.1	0.0	3.1	2.7	0.6	7.0

*"Other Languages" includes classical and modern foreign languages and literature; "Other Humanities" includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

**Includes only individuals who were working outside their doctoral specialty area and gave a reason on the 1981 SDR questionnaire for being so employed.

SOURCE: National Research Council.

There also appears to be a relationship between the field of employment (as opposed to field of doctorate) and the reasons given by field-switching humanists for their being employed outside their Ph.D. fields (Table 2.11). Slightly more than two-thirds of the 1973-1976 humanities Ph.D.s employed in the behavorial and social sciences in 1981 indicated they were so employed because positions in their doctoral fields were not available, compared to only 29 percent of those employed in education. By contrast, among this latter group, almost half said that they were in education jobs because they offered more attractive career options, and another 11 percent had been promoted from their doctoral field to administrative positions in education. Geographic location and salary were not strong motivating forces behind movement from Ph.D. field to another employment field for humanities Ph.D.s.

TABLE 2.11 Reasons Given by 1973-1976 Humanities Ph.D.s for Being Employed Outside Their Ph.D. Field in 1981 by Employment Field

		Field of Employment*					
Reasons Empl Outside Ph.D. Fld	Total	Humanities	Natural Sciences	Behavorial/Social Sci	Education	Professional Fields	Other/No Report
Total Reporting Reason**	3,400	800	400	500	500	700	600
	%	%	%	%	%	%	%
Better Pay	2.7	0.4	8.4	0.6	1.1	5.3	2.0
More Attractive Career Options	29.8	30.6	28.7	19.0	47.9	33.4	20.6
Preferred Geographic Location	1.7	2.5	1.3	1.9	0.4	0.7	2.7
Family/Marital Status Constraints	3.1	3.4	0.5	1.9	4.1	6.0	1.4
Position in Ph.D. Fld Not Available	50.2	51.8	50.7	67.9	29.2	42.8	57.3
Promoted Out of Ph.D. Field	3.0	3.1	2.9	2.7	11.4	0.3	0.0
Other	7.3	7.2	6.3	4.8	4.3	8.7	10.9
Multiple Reasons	2.1	1.0	1.3	1.2	1.5	2.7	4.9

*See the Specialties List in Appendix A for list of fine fields included under each broad field. "Natural Sciences" includes Mathematics, Computer Sciences, Physics/ Astronomy, Chemistry, Earth/Environmental Sciences, Engineering, Agricultural Sciences, Medical Sciences, and the Biological Sciences. "Behavorial/Social Sciences" include Psychology and other Social Sciences.

**Includes only individuals who were working outside their doctoral specialty area and gave a reason on the 1981 SDR questionnaire for being so employed.

SOURCE: National Research Council.

TYPE OF EMPLOYER

In 1981, 83 percent of the 68,000 employed humanities Ph.D.s were working in higher education institutions. This is not surprising in light of the fact that 4-year colleges and universities have traditionally been the primary employer of Ph.D.s in the humanities. Table 2.12 provides data, however, that show a change in this trend among the more recent humanities doctorate recipients.

Almost 90 percent of the 1960-1964 humanities Ph.D.s held jobs at 4-year colleges or universities in 1981 compared to only 68 percent of the 1977-1980 Ph.D.s. The biggest drop in 4-year college/university employment is seen among the mid-1970 graduates: 82 percent of the 1969-1972 Ph D.s were so employed in 1981 compared to only 70 percent of the 1973-1976 group. In contrast, almost one-fourth of the individuals who had earned humanities doctorates within the last eight years were working in nonacademic job settings, compared to only 6 percent of the 1960-1964 Ph.D.s, and additional 7 percent of the most recent graduates were working at 2-year colleges. The more recent humanities Ph.D.s are finding more jobs with nontraditional employers such as business/industry and government (10 percent and 5 percent, respectively).

TABLE 2.12 1981 Type of Employer of Humanities Ph.D.s* by Year of Doctorate

1981 Type of Employer	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Employed	68,000	9,100	6,000	9,000	14,200	16,600	13,100
	%	%	%	%	%	%	%
Academe	82.7	89.0	92.9	86.1	85.9	77.0	75.0
2-Year College	4.9	2.6	4.0	2.7	3.5	7.2	6.9
4-Year Coll/Univ	77.8	86.4	88.9	83.4	82.3	69.8	68.1
Nonacademe	16.7	10.3	6.2	12.2	13.7	22.6	24.9
Business/Industry**	6.7	1.9	1.8	5.8	5.5	9.8	10.1
Government	3.6	3.0	0.3	2.0	2.4	5.8	5.0
Other**	6.5	5.4	4.1	4.4	5.8	7.0	9.8
No Report	0.6	0.7	0.9	1.7	0.4	0.4	0.2

*Includes full-time and part-time employed only.

**"Business/Industry" also includes those self-employed. "Other" include hospital/ clinics, private foundations, elementary/secondary schools, other nonprofit organizations, and any other nonacademic employers.

SOURCE: National Research Council.

Approximately 70 percent of the 1973-1976 humanities Ph.D.s were employed by 4-year colleges or universities in 1981. When examined by field of doctorate, over three-fourths of the Ph.D.s in art history, speech/theater, and philosophy were employed at 4-year colleges and universities, compared to only 58 percent of the history Ph.D.s and 68 percent of the music Ph.D.s (Table 2.13). In contrast, 9 percent of the Ph.D.s in history were working for 2-year colleges compared to only 1 percent of the art history and classical languages Ph.D.s.

In general, business/industry (which includes self-employing enterprises) was the largest nonacademic employment setting of 1973-1976 humanities Ph.D.s in 1981, employing as many as 13 percent of the "other" humanities Ph.D.s and 11 percent of the history Ph.D.s. Government (federal, state, and local) attracted a large percentage of history Ph.D.s (13 percent). As many as 8 percent of the classical languages Ph.D.s were working for elementary or secondary schools. Other nonacademic employers (mostly nonprofit organizations) attracted as many as 11 percent of the Ph.D.s with music degrees.

TABLE 2.13 1981 Type of Employer of 1973-1976 Humanities Ph.D.s* by Field of Doctorate

	Field of Doctorate									
1981 Type of Employer	All Fields	History	Art History	Music	Speech/Theater	Philosophy	Other Humanities**	Engl/Amer Lang& Lit	Classical Lang&Lit	Modern Lang&Lit
Total	16,600	4,300	500	1,300	500	1,300	500	4,600	300	3,300
	%	%	%	%	%	%	%	%	%	%
Academe	77.0	66.9	81.2	74.1	84.1	81.9	75.9	81.5	74.3	81.5
Nonacademe	22.6	32.7	18.1	24.7	15.9	18.1	24.1	18.3	25.7	17.9
No Report	0.4	0.4	0.8	1.2	0.0	0.0	0.0	0.1	0.0	0.5

*Includes full-time and part-time employed only.

**"Other" humanities includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

***"Business/Industry" includes self-employment. "Other" includes hospitals/clinics, private foundations, elementary/secondary schools, other nonprofit organizations, and any other nonacademic employers.

SOURCE: National Research Council

Postgraduation Plans

Humanities Ph.D.s are concerned not only with securing academic employment in the first place, but also with remaining in the academic setting. Overall, almost 90 percent of the 1973-1976 humanities Ph.D.s employed in 1981 who had definite plans for academic employment immediately after the doctorate were still so employed (Table 2.14). In addition, 20 percent of those who had definite nonacademic employment plans at the time of graduation had switched into academe by 1981. When examined by field of doctorate, history Ph.D.s had a somewhat lower retention rate among those who had definite academic employment plans than other humanities fields (82 percent, compared with 90 to 93 percent), and Ph.D.s in "other" humanities had a higher retention rate than other humanities fields among those with definite nonacademic postgraduation plans who were employed in 1981 (85 percent were still in nonacademic jobs, compared to no more than 78 percent in other fields). Employed history Ph.D.s who had been seeking employment at the time of Ph.D. were less likely to be working in academe in 1981 than were those in other humanities fields (52 percent, compared to 65 to 71 percent).

TABLE 2.14 Type of Employer in 1981 for 1973-1976 Humanities Ph.D.s* by Field of Doctorate and Plans at Ph.D.

Field of Doctorate and 1981 Employment Setting	Total All Plans**	Postgraduation Plans: Definite Employment: Academic	Postgraduation Plans: Definite Employment: Nonacademic	Postgraduation Plans: Seeking Employment
Total Employed in 1981	16,600	9,600	900	4,300
	%	%	%	%
Academically Employed	77.0	89.4	20.4	65.0
Nonacademically Employed	22.6	10.6	77.1	34.3
Engl/Amer Lang&Lit Ph.D.s Empl	4,600	2,600	200	1,400
	%	%	%	%
Academically Employed	81.5	92.7	20.0	69.4
Nonacademically Employed	18.3	7.3	76.9	30.6
Other Lang&Lit++ Ph.D.s Empl	3,600	2,000	100	1,000
	%	%	%	%
Academically Employed	80.9	92.7	27.4	69.1
Nonacademically Employed	18.6	7.2	72.6	29.2
History Ph.D.s Employed	4,300	2,500	400	1,000
	%	%	%	%
Academically Employed	66.9	82.2	17.5	51.5
Nonacademically Employed	32.7	17.8	77.8	48.5
Philosophy Ph.D.s Employed	1,300	800	+	300
	%	%	%	%
Academically Employed	81.9	91.0	+	64.7
Nonacademically Employed	18.1	9.0	+	35.3
Other Humanities++ Ph.D.s Empl	2,800	1,700	200	600
	%	%	%	%
Academically Employed	77.5	89.9	15.7	70.9
Nonacademically Employed	21.8	9.9	84.3	26.4

*Percentages based on full-time and part-time employed in 1981, including those who were employed but did not report type of employer.

**Includes Ph.D.s whose postgraduation plans were unknown.

+Population less than 100.

++"Other Lang&Lit" includes classical and modern foreign languages and literature; "Other Humanities" includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

Note: "Academically employed" includes those working at 2-year colleges, 4-year colleges, medical schools, and universities. "Nonacademically employed includes those working at elementary/secondary schools, business/industry, self-employment, government (U.S., state, local, other), hospital/clinics, private foundations, other nonprofit organizations, and any other employers, excluding academe.

SOURCE: National Research Council.

TENURE STATUS

Ph.D. Year and Field Comparison

Of the 56,300 academically employed humanities Ph.D.s in the United States in 1981, 70 percent were tenured, 14 percent were in tenure-track positions, and 12 percent were in nontenure-track appointments. As seen in Table 2.15, the percentage of humanists in nontenure-track positions is considerably higher among the more recent Ph.D. recipients. Among those academically employed, approximately 14 percent of the 1973-1976 Ph.D.s and as many as 26 percent of the 1977-1980 Ph.D.s held nontenure-track positions in 1981 compared to only 4 percent of the 1960-1964 Ph.D.s. Tenure decisions are usually made within 8-9 years after the doctorate. In 1981, about 22 percent of the 1973-1976 Ph.D.s and 42 percent of the 1977-1980 Ph.D.s were in tenure-track positions but were not yet tenured, compared to only 6 percent of the 1969-1972 Ph.D. group.

TABLE 2.15 1981 Tenure Status of Academically* Employed Humanities Ph.D.s by Year of Doctorate

	Total	Year of Doctorate					
Tenure Status	1938-1980	1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Academe	56,300	8,100	5,600	7,800	12,200	12,800	9,800
	%	%	%	%	%	%	%
Track Position	84.0	91.5	95.4	92.6	86.5	80.2	66.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	57.8	24.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22.4	42.0
Nontenure Track	11.7	5.8	3.8	5.0	9.1	14.3	26.4
Not Tenured, Status Unknown	3.8	1.8	0.4	1.7	2.8	4.0	6.4
No Report	1.1	0.9	0.4	0.7	1.6	1.5	1.0

*Includes those employed full-time or part-time at colleges or universities.

SOURCE: National Research Council.

Employment Status

Of the 12,800 academically employed 1973-1976 humanities Ph.D.s, only 700 were employed part-time in 1981. Approximately 69 percent of these individuals held nontenure-track positions, compared to 11 percent of those employed full-time. In addition, as few as 7 percent of the part-time employed were tenured in 1981, whereas 61 percent of those employed full-time were tenured.

TABLE 2.16 1981 Tenure Status of Academically* Employed 1973-1976 Humanities Ph.D.s by Employment Status

Tenure Status	Total Academic	Full-Time	Part-time
Total Academically Employed	12,800	12,100	700
	%	%	%
Track Position	80.2	84.1	14.4
Nontenure Track	14.3	11.1	68.7
Not Tenured, Status Unknown	4.0	3.7	9.0
No Report	1.5	1.1	7.9

*Includes those employed full-time or part-time at colleges and universities.

SOURCE: National Research Council.

Type of Institution

Tenure status for the full-time academically employed 1973-1976 humanities Ph.D.s is somewhat related to the type of academic employer (Table 2.17). Of the 12,100 humanities doctorates who earned their degrees between 1973 and 1976 and were employed full-time in academe in 1981, 84 percent held tenure-track positions, and 61 percent were tenured. At 2-year colleges, 72 percent held tenure-track positions, with 64 percent tenured. At 4-year colleges, these percentages increased--86 percent held tenure-track positions and 63 percent were already tenured--and at universities 85 percent were in tenure-track positions, with 59 percent tenured. Nontenure-track appointments were held by 11 percent of all the full-time, academically employed 1973-1976 humanities Ph.D.s in 1981. By type of institution, however, as many as 19 percent of those employed at 2-year colleges were in nontenure-track positions.

TABLE 2.17 1981 Tenure Status of Full-time Academically* Employed 1973-1976 Humanities Ph.D.s by Type of Employing Institution

Tenure Status	Total Academic Institution	Type of Institution 2-Year College	4-Year College	University
Total Academically Employed	12,100	1,100	4,200	6,800
	%	%	%	%
Track Position	84.1	72.3	85.5	85.2
Tenured	60.9	63.6	63.4	58.8
Not Tenured	23.3	8.6	22.1	26.3
Nontenure Track	11.1	19.2	10.6	10.1
Not Tenured, Status Unknown	3.7	7.2	3.3	3.4
No Report	1.1	1.3	0.6	1.4

*Includes those employed full-time at colleges and universities.

SOURCE: National Research Council.

Sex

As seen in Table 2.18, 1973-1976 female humanities Ph.D.s employed in full-time positions at universities were almost twice as likely to hold nontenure-track positions as males similarly employed (15 percent of the women, compared to 8 percent of the men). Furthermore, among those humanists in full-time tenure-track positions at 4-year colleges or universities, the women lagged behind men in the attainment of tenure in all humanities fields--with the exception of "other" humanities Ph.D.s employed at 4-year colleges, where the incidence of tenure was virtually equal.

TABLE 2.18 1981 Tenure Status of 1973-1976 Humanities Ph.D.s Employed Full-time at 4-Year Colleges or Universities by Sex and Field of Doctorate

Field of Doctorate and Tenure Status	4-Year College Men	4-Year College Women	University Men	University Women
Total Full-Time Employed	2,900	1,200	4,700	2,100
	%	%	%	%
Track Position	86.2	84.0	89.1	76.4
Tenured	67.3	54.1	65.6	43.7
Not Tenured	18.8	29.9	23.5	32.7
Nontenure Track	9.4	13.3	7.8	15.2
Engl/Amer Lang&Lit Ph.D.s	900	500	1,200	700
	%	%	%	%
Track Position	90.9	86.1	92.6	74.2
Tenured	70.1	58.3	69.6	43.3
Not Tenured	20.9	33.8	22.5	31.0
Nontenure Track	4.8	12.9	5.5	17.8
Other Lang&Lit* Ph.D.s	500	400	1,000	600
	%	%	%	%
Track Position	88.1	86.0	91.9	81.1
Tenured	63.4	52.6	59.8	47.5
Not Tenured	24.7	33.4	32.0	33.7
Nontenure Track	6.6	11.7	4.0	10.3
History Ph.D.s	700	100	1,200	300
	%	%	%	%
Track Position	81.3	79.2	85.6	61.5
Tenured	73.4	62.5	64.9	33.3
Not Tenured	7.9	16.7	20.7	21.8
Nontenure Track	14.3	18.8	9.2	25.2
Philosophy Ph.D.s	400	100	400	100
	%	%	%	%
Track Position	81.9	63.6	80.0	87.4
Tenured	68.5	47.3	60.3	41.4
Not Tenured	13.4	16.2	19.7	44.0
Nontenure Track	11.5	18.2	18.6	12.6
Other Humanities* Ph.D.s	500	200	1,000	400
	%	%	%	%
Track Position	86.7	85.8	90.1	82.9
Tenured	56.3	60.1	59.0	47.1
Not Tenured	30.4	25.6	30.1	35.8
Nontenure Track	11.4	11.6	8.4	10.3

Note: Percentages based on total employed full-time at institution, including those who did not report track or tenure status.

*"Other Lang&Lit" includes classical and modern foreign languages and literature; "Other Humanities" includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

SOURCE: National Research Council.

Longitudinal Analyses

Table 2.19 presents analysis of the tenure status of academically employed humanities Ph.D.s 5-8 years after receipt of their degrees, a period when tenure decisions are beginning to be made. Overall, 67 percent of the 1969-1972 humanities Ph.D.s were tenured in 1977, 61 percent of the 1971-1974 Ph.D.s in 1979, and 58 percent of the 1973-1976 Ph.D.s in 1981. The greatest decline in percentage of tenured Ph.D.s occurred for philosophy doctorates, 72 percent in 1977 compared to 57 percent in 1981. It should be noted that the greatest decrease occurred between 1977 and 1979 for philosophy Ph.D.s. This was also true for Ph.D.s in "other" humanities and "other" languages. For English Ph.D.s, the greatest decrease occurred between 1979 and 1981.

TABLE 2.19 Tenure Status of Humanities Ph.D.s Employed in Academe* 5-8 Years After the Doctorate (1977, 1979, 1981)

	Tenured		
	1977	1979	1981
Field of Doctorate	1969-72 Ph.D.s %	1971-74 Ph.D.s %	1973-76 Ph.D.s %
Humanities Total	67.0	61.2	57.8
English	64.9	64.7	58.7
Other Languages**	64.1	55.2	53.1
History	71.0	66.2	61.1
Philosophy	72.0	57.3	56.3
Other Humanities**	65.4	58.0	58.7

*Percentages based on total full-time and part-time employed at colleges and universities.

**"Other Languages" includes classical and modern foreign languages and literature. "Other Humanities" includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

SOURCE: National Research Council.

1977 Employer

Over three-fourths of the 1973-1976 humanities Ph.D.s who were academically employed in both 1977 and 1981 were employed at the same institution in both years (Table 2.20). Approximately 72 percent of these Ph.D.s were tenured in 1981, compared to 25 percent of those who switched institutions between 1977 and 1981. It should be noted that for those who switched academic institutions, higher percentages were in tenure-track, not tenured and nontenure-track positions, than those who had remained at the same institution from 1977 to 1981.

TABLE 2.20 1981 Tenure Status of 1973-1976 Humanities Ph.D.s* by Whether Employed at Same Institution, 1977-1981

Tenure Status	Same Institution	Different Institution
Total Academically Employed*	6,400	1,600
	%	%
Track Position	87.8	71.0
Nontenure Track	8.6	22.5
Not Tenured, Status Unknown	2.8	5.2
No Report	0.8	1.3

* Includes only those known to be full-time or part-time employed at colleges and universities in 1977 and 1981.

SOURCE: National Research Council.

Postgraduation Plans

Among the 1973-1976 humanities Ph.D.s who were academically employed in 1981, almost 70 percent who had definite employment plans after receiving their degrees were tenured in 1981, compared to only 28 percent of those who were still seeking employment at the time of Ph.D. receipt (Table 2.21). In fact, as many as 27 percent of those who had been seeking employment at graduation held nontenure-track positions in 1981, compared to less than 10 percent of those who had definite employment plans at graduation.

TABLE 2.21 1981 Tenure Status of Academically* Employed 1973-1976 Humanities Ph.D.s by Plans at Ph.D.

Tenure Status	Postgraduation Plans: Definite Employment	Postgraduation Plans: Seeking Employment
Total Academically Employed*	8,800	2,800
	%	%
Track Position	86.9	64.1
Tenured	69.0	28.2
Not Tenured	18.0	35.9
Nontenure Track	9.5	26.6
Not Tenured, Status Unknown	2.8	5.7
No Report	0.8	3.6

*Includes only those employed full-time and part-time at colleges and universities.

SOURCE: National Research Council.

ACADEMIC POSITION

Ph.D. Year and Field Comparison

The achievement of senior academic rank also appears to occur within 8-9 years after receipt of the doctorate. In 1981, only 19 percent of the 1977-1980 humanities Ph.D.s held the ranks of full or associate professor, compared to 54 percent of the 1973-1976 Ph.D.s and 81 percent of the 1969-1972 Ph.D.s (Table 2.22). Also, of note is the increase in the percentage of off-ladder staff (i.e., instructors, other nonprofessorial faculty, and nonfaculty) among recent Ph.D. recipients--20 percent of the 1977-1980 graduates held such positions in 1981, compared to only 5 percent of the 1960-1964 graduates.

TABLE 2.22 1981 Academic Position of 1938-1980 Humanities Ph.D.s by Year of Doctorate

1981 Position	Total 1938-1980	Year of Doctorate 1938-1959	1960-1964	1965-1968	1969-1972	1973-1976	1977-1980
Total Acad. Employed	56,300	8,100	5,600	7,800	12,200	12,800	9,800
	%	%	%	%	%	%	%
Faculty	96.1	98.5	97.7	98.2	95.2	95.2	93.9
Nonfaculty	3.1	0.7	1.3	1.5	3.9	3.9	5.2
No Report	0.8	0.8	1.0	0.3	1.0	0.9	0.9

* Includes those full-time and part-time employed at colleges and universities.

SOURCE: National Research Council.

Advancement in academic rank can be more clearly seen by examining the academic position of 1973-1976 humanities Ph.D.s by field and individual year of Ph.D. Table 2.23 points out that only 40 percent of the 1976 Ph.D.s held the rank of full professor or associate professor in 1981 compared to almost 69 percent of the 1973 Ph.D.s. The largest shift into the associate professor level occurred between the 1974 (7 years from receipt of Ph.D.) and the 1975 Ph.D.s (6 years from receipt of Ph.D.)--48 percent of the 1974 Ph.D.s were associate professors in 1981 compared to 39 percent of the 1975 Ph.D.s.

By field, history and "other" humanities Ph.D.s had the highest percentages of faculty members holding full or associate professorships; as many as 76 percent of the 1973 history Ph.D.s and 73 percent of the 1973 Ph.D.s in "other" humanities were full or associate professors. On the other hand, 1973-1976 history Ph.D.s were more likely than other humanities doctorates to hold instructorships or other off-ladder positions (20 percent, compared to 10-15 percent).

Longitudinal Analyses

An analysis of the rank of humanities Ph.D.s during the past four years provides additional information about the situation for humanists in their traditional employment setting, academe. Table 2.24 provides data on academic rank for Ph.D.s who were 5-8 years past the receipt of their doctorates in 1977, 1979, and 1981.

The percentage of humanists 5-8 years past receipt of their Ph.D. degree who held ladder positions (i.e., full professorships, associate professorships, assistant professorships) has steadily decreased since 1977--approximately 93 percent of the 1969-1972 Ph.D.s held such positions in 1977, compared to 90 percent of the 1971-1973 graduates in 1979 and 86 percent of the 1973-1976 group in 1981. Overall, within individual ranks, there has been a small decrease from 1977 to 1981 in the percentage of humanists Ph.D.s 5-8 years past receipt of their Ph.D. who held full or associate professorships. The percentage of humanists holding the rank of assistant professor has remained relatively unchanged over the years.

By field, there has been a steady decline in the percentages of Ph.D.s in "other" languages and philosophy who held the rank of associate professor and of history Ph.D.s who held the rank of assistant professor. In comparison to other Ph.D. year cohorts in the same field, there was an unusually high percentage of history and philosophy Ph.D.s with full professorships for the 1971-1974 group surveyed in 1979.

TABLE 2.23 1981 Academic Position of 1973-1976 Humanities Ph.D.s* by Year and Field of Doctorate

Field of Doctorate and 1981 Position	Total 1973-1976	Year of Doctorate 1973	1974	1975	1976
Total Academically Employed	12,800	3,500	3,200	3,200	2,900
	%	%	%	%	%
Faculty	95.2	96.5	95.9	93.8	94.6
Professor	9.7	15.0	10.4	6.0	6.7
Associate Professor	44.1	53.9	48.3	39.0	33.6
Assistant Professor	31.8	19.9	28.3	37.7	43.4
Instructor	3.7	2.2	4.4	4.7	3.6
Other Faculty	5.9	5.5	4.6	6.4	7.3
Nonfaculty	3.9	2.5	3.1	5.4	4.6
No Report	0.9	1.0	1.0	0.7	0.8
Engl/Amer Lang&Lit Ph.D.s	3,800	1,100	900	900	900
	%	%	%	%	%
Faculty	95.2	95.2	94.5	97.3	94.0
Nonfaculty	3.4	2.9	3.2	2.0	5.4
No Report	1.4	2.0	2.3	0.7	0.7
Other Lang&Lit** Ph.D.s	2,900	700	800	700	600
	%	%	%	%	%
Faculty	96.6	95.3	99.0	94.4	97.5
Nonfaculty	3.0	4.7	0.7	5.4	1.2
No Report	0.4	0.0	0.2	0.3	1.3

*Includes only those full-time or part-time employed at colleges and universities.

**"Other Languages" includes classical and modern foreign languages and literature.

Note: Totals do not agree with the sum of its parts because of rounding.

SOURCE: National Research Council.

TABLE 2.23 1981 Academic Position of 1973-1976 Humanities Ph.D.s* by Year and Field of Doctorate (continued)

Field of Doctorate and 1981 Position	Total 1973-1976	Year of Doctorate 1973	1974	1975	1976
History Ph.D.s	2,900	800	600	800	700
	%	%	%	%	%
Faculty	92.8	99.0	92.6	88.9	90.3
Professor	12.1	22.6	5.6	5.2	13.4
Associate Professor	45.6	53.3	47.5	45.2	34.9
Assistant Professor	21.5	7.0	29.2	23.5	29.8
Instructor	5.9	5.8	6.3	6.7	4.7
Other Faculty	7.8	10.3	3.9	8.2	7.6
Nonfaculty	6.5	1.0	7.0	9.6	8.9
No Report	0.7	0.0	0.3	1.5	0.8
Philosophy Ph.D.s	1,100	400	300	200	200
	%	%	%	%	%
Faculty	93.4	94.3	95.9	88.3	94.4
Professor	7.0	11.1	6.0	5.0	3.8
Associate Professor	42.1	55.3	42.3	33.8	29.6
Assistant Professor	35.0	18.2	39.7	39.6	51.6
Instructor	3.5	4.0	1.5	3.8	5.2
Other Faculty	5.7	5.7	6.4	6.3	4.2
Nonfaculty	5.9	3.4	4.1	11.7	5.6
No Report	0.7	2.3	0.0	0.0	0.0
Other Humanities** Ph.D.s	2,200	600	500	600	500
	%	%	%	%	%
Faculty	97.6	98.6	96.8	96.9	98.2
Professor	15.1	19.2	21.6	12.1	7.3
Associate Professor	46.3	53.5	49.1	49.0	32.2
Assistant Professor	27.9	18.3	20.0	30.5	43.4
Instructor	1.4	1.3	0.4	2.6	1.4
Other Faculty	7.0	6.3	5.7	2.7	13.9
Nonfaculty	1.5	0.5	1.9	2.4	1.2
No Report	0.9	0.9	1.3	0.7	0.6

*Includes only those full-time or part-time employed at colleges and universities.

**"Other Humanities" includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

Note: Totals do not agree with the sum of its parts because of rounding.

SOURCE: National Research Council.

Table 2.24 1981 Academic Position of Humanities Ph.D.s* 5-8 Years After the Doctorate (1977, 1979, and 1981)

Field of Doctorate and Academic Position	1977 1969-72 Ph.D.s	1979 1971-74 Ph.D.s	1981 1973-76 Ph.D.s
Total Humanities	12,100	13,400	12,800
	%	%	%
Professor	11.4	13.8	9.7
Associate Professor	49.7	43.7	44.1
Assistant Professor	31.4	32.1	31.8
Instructor	2.0	1.8	3.7
Other	5.6	8.5	10.7
Engl/Amer Lang&Lit	3,800	3,800	3,800
	%	%	%
Professor	10.5	5.9	7.7
Associate Professor	48.0	43.6	44.9
Assistant Professor	33.7	40.4	35.3
Instructor	2.4	0.6	2.2
Other	5.3	9.5	9.9
Other Languages**	2,300	2,900	2,900
	%	%	%
Professor	7.1	7.0	7.0
Associate Professor	51.0	45.1	40.8
Assistant Professor	37.3	39.6	39.2
Instructor	0.8	1.5	5.2
Other	3.8	6.8	7.8
History	3,100	3,300	2,900
	%	%	%
Professor	13.8	26.7	12.1
Associate Professor	52.2	39.6	45.6
Assistant Professor	26.4	22.0	21.5
Instructor	1.9	2.7	5.9
Other	5.6	9.0	15.0
Philosophy	1,000	1,100	1,100
	%	%	%
Professor	1.7	11.2	7.0
Associate Professor	55.2	46.3	41.9
Assistant Professor	41.0	30.1	34.9
Instructor	2.1	3.5	3.5
Other	5.0	8.9	12.3
Other Humanities**	1,900	2,300	2,200
	%	%	%
Professor	19.8	18.7	15.1
Associate Professor	47.1	46.8	46.3
Assistant Professor	22.4	24.3	27.9
Instructor	2.4	2.1	1.4
Other	8.3	8.1	9.4

*Includes only those full-time or part-time employed at colleges or universities, including those in administrative, other faculty, and nonfaculty positions.

**"Other Languages" includes classical and modern foreign languages and literatures. "Other Humanities" includes art history, speech/theater, music, library/archival sciences, general humanities, and any other humanities fields not listed above.

SOURCE: National Research Council.

Employment Status

Among the academically employed 1973-1976 humanities Ph.D.s, only 10 percent of those employed part-time held the ranks of full or associate professor, compared to almost 57 percent of the full-time employed group (Table 2.25). Nearly 60 percent of the part-time academically employed humanists were in off-ladder positions (instructors, administrators, lecturers, and nonfaculty positions), compared to only 11 percent of those employed full-time.

TABLE 2.25 1981 Academic Position of 1973-1976 Humanities Ph.D.s by Employment Status

1981 Position	Total Academic	Full-Time	Part-Time
Total Academically Employed*	12,800	12,100	700
	%	%	%
Faculty	95.2	96.1	81.6
Nonfaculty	3.9	3.3	13.4
No Report	0.9	0.6	5.0

*Includes only those full-time or part-time employed at colleges or universities.

SOURCE: National Research Council.

Type of Institution

As is true with science and engineering Ph.D.s, the achievement of senior academic rank for humanities doctorates is dependent upon the type of institution at which an individual is employed. Of the 12,100 full-time academically employed humanities Ph.D.s who earned their degrees between 1973 and 1976, over 96 percent were in faculty positions (Table 2.26). Of these faculty members, only 10 percent were full professors, 46 percent were associate professors, and 32 percent were assistant professors. Across all types of academic institutions, the majority of the 1973-1976 Ph.D.s were in the rank of associate professor.

TABLE 2.26 1981 Academic Position of Full-Time Employed 1973-1976 Humanities Ph.D.s by Type of Employing Institution

1981 Position	Total Academic Institution	Type of Institution: 2-Year College	4-Year College	University
Total Full-Time Academically Employed	12,100	1,100	4,200	6,800
	%	%	%	%
Faculty	96.1	97.4	97.6	94.9
Professor	10.3	19.4	[illegible]	[illegible]
Associate Professor	46.4	28.0	[illegible]	[illegible]
Assistant Professor	32.1	7.8	[illegible]	[illegible]
Instructor	2.5	27.1	[illegible]	[illegible]
Other Faculty	4.8	15.7	[illegible]	[illegible]
Nonfaculty	3.3	2.4	2.0	4.2
No Report	0.6	0.2	0.4	0.9

SOURCE: National Research Council.

Advancement to full professorship for humanities Ph.D.s was slower in the universities than in other academic settings. Only 6 percent of the university-employed humanists were full professors, but as many as 48 percent were associate professors, and 36 percent were assistant professors. The Ph.D.s in 4-year colleges had higher percentages in full professorships (14 percent), but the percentages of those in the associate and assistant professor ranks were similar to those at universities (48 percent and 32 percent, respectively). Although 19 percent of the 1973-1976 humanities Ph.D.s employed at 2-year colleges held the rank of full professor, another 45 percent were in off-ladder positions (i.e., instructors, other faculty, and nonfaculty).

Postgraduation Plans

Among academically employed 1973-1976 humanities Ph.D.s, more than 97 percent with definite employment plans at the time of graduation held faculty positions in 1981, and 64 percent of them were full or associate professors. In contrast, for those academically employed in 1981 who had been seeking employment at the time of Ph.D. receipt, approximately one-fourth held off-ladder positions (i.e., instructor, other faculty, and nonfaculty staff) and another 45 percent were at the assistant professor rank.

TABLE 2.27 1981 Academic Position of 1973-1976 Humanities Ph.D.s by Plans at Ph.D.

1981 Position	Postgraduation Plans: Definite Employment	Postgraduation Plans: Seeking Employment
Total Academically Employed*	8,800	2,800
	%	%
Faculty	97.4	89.3
[redacted]		
Nonfaculty	2.4	8.1
No Report	0.2	2.6

*Includes only those employed full-time or part-time at colleges and universities.

SOURCE: National Research Council.

1977 Employer

In 1981, almost two-thirds of the academically employed 1973-1976 humanities Ph.D.s who were at the same institution as they had been in 1977 held the rank of full or associate professor, compared to approximately one-third of those who had switched institutions between 1977 and 1981 (Table 2.28). Among those Ph.D.s who had switched institutions, nearly half held the rank of assistant professor and another 21 percent held off-ladder positions (i.e., instructorships, other faculty, and nonfaculty positions) in 1981, compared to only 26 percent and 8 percent, respectively, of those who stayed at the same institution between 1977 and 1981.

TABLE 2.28 1981 Academic Position of 1973-1976 Humanities Ph.D.s by Whether Employed at Same Institution, 1977-1981

1981 Position	Same Institution	Different Institution
Total Academically Employed*	6,400	1,600
	%	%
Faculty	98.7	95.5
Nonfaculty	1.3	3.5
No Report	0.1	1.0

*Includes those known to be full-time or part-time employed at colleges or universities in both 1977 and 1981.

SOURCE: National Research Council.

APPENDIX A

1981 SURVEY OF DOCTORATE RECIPIENTS QUESTIONNAIRE AND SPECIALTIES LIST AND 1981 ABBREVIATED QUESTIONNAIRE

1981 SURVEY OF DOCTORATE RECIPIENTS

OMB No. 3145-0020

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION, THE NATIONAL ENDOWMENT FOR THE HUMANITIES, THE NATIONAL INSTITUTES OF HEALTH, AND THE DEPARTMENT OF ENERGY

NOTE: THIS INFORMATION IS SOLICITED UNDER THE AUTHORITY OF THE NATIONAL SCIENCE FOUNDATION ACT OF 1950, AS AMENDED. ALL INFORMATION YOU PROVIDE WILL BE TREATED AS CONFIDENTIAL, WILL BE SAFEGUARDED IN ACCORDANCE WITH THE PROVISIONS OF THE PRIVACY ACT OF 1974, AND WILL BE USED FOR STATISTICAL PURPOSES ONLY. INFORMATION WILL BE RELEASED ONLY IN THE FORM OF STATISTICAL SUMMARIES OR IN A FORM WHICH DOES NOT IDENTIFY INFORMATION ABOUT ANY PARTICULAR PERSON. YOUR RESPONSE IS ENTIRELY VOLUNTARY AND YOUR FAILURE TO PROVIDE SOME OR ALL OF THE REQUESTED INFORMATION WILL IN NO WAY ADVERSELY AFFECT YOU.

If your name and address are incorrect, please enter correct information below.

INCLUDE NEW NINE-DIGIT ZIP CODE IF KNOWN (10)

If there is an alternate address through which you can always be reached, please provide it on the line below.

c/o Number Street City State ZIP Code (11)

1a. How many full-time equivalent years of professional work experience have you had? _____ Year(s) (12-13)

b. Since receiving the doctorate, how many full-time equivalent years of professional work experience have you had? _____ Year(s) (14-15)

c. Since receiving the doctorate, how many full-time equivalent years of work experience, if any, involved teaching? _____ Year(s) (16-17)

2. What was your employment status (includes postdoctoral appointment*) during FEBRUARY 1981? ☐ Circle your selection and enter number from below (18)

1. Employed full-time (Skip to Question #4)
2. Employed part-time
   If you were employed part-time, were you seeking full-time employment? ☐ Yes ☐ No (19)
3. Postdoctoral appointment*
   If you held a postdoctoral appointment, was it ☐ full-time (Skip to Question #4) ☐ part-time (20)
4. Unemployed and seeking employment
5. Not employed and not seeking employment
6. Retired and not employed
7. Other, specify _____

(Skip to Question #20)

*Temporary appointment in academia, industry or government, the primary purpose of which is to provide for continued education or experience in research.

3. If you were employed part-time during FEBRUARY 1981, what was the MOST important reason for being in that position? ☐ Enter number from below (21)

1. Part-time employment preferred
2. Full-time position not available
3. Constraints due to family or marital status
4. Other, specify _____

4. From the Degree and Employment Specialties List on page 4 select and enter both the number and title of the employment specialty most closely related to your principal employment or postdoctoral appointment during FEBRUARY 1981. Write in your specialty if it is not on the list.

Number Title of Employment Specialty (22-24)

5. If you were employed during FEBRUARY 1981 in a specialty field other than your field of Ph.D., what was the MOST important reason for being in that position? ☐ Enter number from below (25)

1. Better pay
2. More attractive career options
3. Preferred specific geographic location
4. Constraints due to family or marital status
5. Position in Ph.D. field not available
6. Promoted out of position in Ph.D. field
7. Other, specify _____

6. Please give the name of your principal employer (company, organization, postdoctoral institution, etc. or, if self employed, write "self") and actual place of employment during FEBRUARY 1981.

Name of Employer (26-31)

Number Street

City State

ZIP Code (32-40)

7. **Which category below best describes the type of organization of your principal employment OR postdoctoral appointment during FEBRUARY 1981?**

Enter number from below ☐ (41-42)

1. Business or industry (including self-employed)
2. Junior college, 2-year college, technical institute
3. Medical school (including university affiliated hospital or medical center)
4. 4-year college
5. University, other than medical school
6. Elementary or secondary school system
7. Private foundation
8. Hospital or clinic
9. U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA
10. U.S. government, civilian employee
11. State government
12. Local or other government, specify _____
13. Nonprofit organization, other than those listed above
14. Other, specify _____

8. **What were your primary and secondary work activities during FEBRUARY 1981? (Enter number from the list provided below)**

Primary ☐ (43-44) Secondary ☐ (45-46)

1. Teaching
2. Basic research
3. Applied research
4. Development of equipment, products, systems, data
5. Design
6. Writing
7. Editing
8. Professional services to individuals

Management or administration of

9. Research and development
10. Educational programs
11. Other
12. Consulting
13. Production
14. Cultural resources
15. Archival work
16. Curatorial work
17. Performing arts
18. Quality control, inspection, testing
19. Sales, marketing, purchasing, estimating
20. Other, specify _____

9. **What was the basic annual salary* associated with your principal professional employment during FEBRUARY 1981? If you were on a postdoctoral appointment (see question #2 for definition), what was your stipend plus allowances?** $ _____ per year (47-49)

Check whether salary was for ☐ 9-10 months or ☐ 11-12 months (50)

*Basic salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.

10a. **What was your basic annual salary* for the year ending December 31, 1980?** $ _____ per year (51-53)

Check whether salary was for ☐ 9-10 months or ☐ 11-12 months (54)

b. **What was your gross professional income† for the year 1980?** $ _____ per year (55-57)

†Gross professional income is all payments received for professional activities including basic salary before deductions plus bonuses, consulting fees, honoraria, royalties, rental and subsistence allowances, etc.

11. **What percentage of your professional work time did you devote to each of the following activities during FEBRUARY 1981?** (Total should equal 100%)

%		%	
1. _____	(58) Management or administration of R&D	7. _____	(70) Consulting
2. _____	(60) Management or administration of educational programs	8. _____	(72) Writing/editing
3. _____	(62) Management or administration of other programs	9. _____	(74) Development/design
4. _____	(64) Teaching	10. _____	(76) Cultural resources
5. _____	(66) Applied research	11. _____	(78) Other, specify _____
6. _____	(68) Basic research		

12. **If you were employed by an academic institution during FEBRUARY 1981, did you hold a tenured position?** 1 ☐ Yes 2 ☐ No (10)

If YES, what year was tenure granted? _____ (11-12)

If NO, did you hold a tenure-track position? 1 ☐ Yes 2 ☐ No (13)

13. **If you were employed by an academic institution during FEBRUARY 1981, what was the rank of your position?** Enter number from below ☐ (14)

Faculty

1. Professor
2. Associate professor
3. Assistant professor
4. Instructor
5. Administrator
6. Other, specify _____ *Title*

Non-Faculty

7. Teaching staff
8. Research staff
9. Other, specify _____ *Title*

14. **Was any of your work during FEBRUARY 1981 supported or sponsored by U.S. Government funds?**

1 ☐ Yes 2 ☐ No 3 ☐ Don't Know (15)

If YES, which federal agencies or departments were supporting the work?

Enter number(s) from the List of Federal Supporting Agencies on page 4. _____ (16-39)

15. **How important was your DOCTORAL degree in enabling you to attain your present position?** (Check only one.)

1 ☐ Essential qualification
2 ☐ Helpful, but not essential
3 ☐ Unimportant
4 ☐ Cannot ascertain (40)

16. Listed below are selected topics of national interest. If you devoted a proportion of your professional time which you considered significant to any of these problem areas during FEBRUARY 1981, please give the corresponding number of the ONE on which you spent the MOST time.

☐ Enter number from below (41-42)

1. Energy or fuel
2. Health
3. Defense
4. Environ. protection, pollution control
5. Education (other than teaching)
6. Space
7. Crime prevention and control
8. Food and other agricultural products
9. Natural resources, other than fuel or food
10. Community development and services
11. Housing (planning, design, construction)
12. Transportation, communications
13. Cultural life
14. Other area, specify _____

If you did not select energy or fuel (category #1) in question #16, please skip to question #20.

17. From the list below, give the corresponding number of the ONE energy source that involved the LARGEST proportion of your energy-related work during FEBRUARY 1981.

☐ Enter number from below (43)

1. Coal and coal products
2. Petroleum (including oil shale and tar sands) or natural gas
3. Fission
4. Fusion
5. Hydroenergy
6. Direct solar (including space and water heating, thermal, electric)
7. Indirect solar (winds, tides, biomass, etc.)
8. Geothermal
9. Other, specify _____

18. Please read the following list of energy-related activities and give the corresponding number(s) from the list below of the activity(ies) in which you were engaged during FEBRUARY 1981. Enter number(s) from below _____ (44-63)

1. Exploration
2. Extraction (gas, oil, mining)
3. Manufacture of energy-related components or products
4. Fuel processing (including refining and enriching)
5. Electric power generation
6. Transportation, transmission, distribution of fuel or energy
7. Energy storage
8. Energy utilization, management
9. Fuel reprocessing or disposal
10. Energy conservation
11. Environmental impact (health, economic, etc.)
12. Education, training
13. Research and development
14. Other, specify _____

19. Please enter the number 1-14 from question #18 that BEST describes the activity in which you spent MOST of your energy related time. ☐ (64-65)

20. What is the major field of your doctorate? Please use the Specialties List on page 4. Please provide the name of the institution where the degree was earned and the year the degree was granted.

Ph.D. Field (66-68) Month and Year Granted (69-71) Institution (72-77)

21. Date of Birth

Mo Day Year

___ ___ ___ (10-14)

22. Citizenship

1 ☐ U.S. Native Born
2 ☐ U.S. Naturalized
3 ☐ Non-U.S., Immigrant (Perm. Res.)
4 ☐ Non-U.S., Immigrant (Temp. Res.) (15)

IF NON-U.S., specify country of citizenship _____ (16-17)

23a. What is your marital status?

1 ☐ Now Married
2 ☐ Widowed
3 ☐ Never Married
4 ☐ Divorced, separated (18)

23b. Do you have any children living with you who are:

Under 6 years of age? 1 ☐ Yes How many? _____ 2 ☐ No (19-20)

Between 6 and 18 years of age? 1 ☐ Yes How many? _____ 2 ☐ No (21-22)

24. Are you physically handicapped? 1 ☐ Yes 2 ☐ No (23) If Yes, enter number(s) from below _____ (24-27)

1 Visual 2 Auditory 3. Ambulatory 4. Other, specify _____

25a. What is your racial background?

1 ☐ American Indian or Alaskan Native
2 ☐ Asian or Pacific Islander
3 ☐ Black
4 ☐ White (28)

25b. Is your ethnic heritage Hispanic?

1 ☐ Yes
2 ☐ No (29)

If Yes, is it:
1 ☐ Mexican-American
2 ☐ Puerto Rican
3 ☐ Other Hispanic (30)

Thank you for completing this questionnaire. Please return the completed form in the enclosed envelope to the Commission on Human Resources, JH638, National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418.

DEGREE AND EMPLOYMENT SPECIALTIES LIST

MATHEMATICAL SCIENCES

000 Algebra
010 Analysis & Functional Analysis
020 Geometry
030 Logic
040 Number Theory
052 Probability
055 Math. Statistics (see also 544, 670, 725, 727)
060 Topology
082 Operations Research (see also 478)
085 Applied Mathematics
089 Combinatorics & Finite Mathematics
091 Physical Mathematics
098 Mathematics, General
099 Mathematics, Other*

COMPUTER SCIENCES

071 Theory
072 Software Systems
073 Hardware Systems
074 Intelligent Systems
079 Computer Sciences, Other (see also 437, 476)

PHYSICS & ASTRONOMY

101 Astronomy
102 Astrophysics
110 Atomic & Molecular
120 Electromagnetism
130 Mechanics
132 Acoustics
134 Fluids
135 Plasma
136 Optics
138 Thermal
140 Elementary Particles
150 Nuclear Structure
160 Solid State
198 Physics, General
199 Physics, Other*

CHEMISTRY

200 Analytical
210 Inorganic
215 Synthetic Inorganic & Organometallic
220 Organic
225 Synthetic Organic & Natural Products
230 Nuclear
240 Physical
245 Quantum
250 Theoretical
255 Structural
260 Agricultural & Food
265 Thermodynamics & Material Properties
270 Pharmaceutical
275 Polymers
280 Biochemistry (see also 540)
285 Chemical Dynamics
298 Chemistry, General
299 Chemistry, Other*

EARTH, ENVIRONMENTAL AND MARINE SCIENCES

301 Mineralogy, Petrology
305 Geochemistry
310 Stratigraphy, Sedimentation
320 Paleontology
330 Structural Geology
341 Geophysics (Solid Earth)
350 Geomorph. & Glacial Geology
391 Applied Geol., Geol. Engr. & Econ. Geol.
395 Fuel Tech. & Petrol. Engr. (see also 479)
360 Hydrology & Water Resources
370 Oceanography
397 Marine Sciences, Other*
381 Atmospheric Physics & Chemistry
382 Atmospheric Dynamics
383 Atmospheric Sciences, Other*
388 Environmental Sciences, General (see also 480, 528)
389 Environmental Sciences, Other*
398 Earth Sciences, General
399 Earth Sciences, Other*

ENGINEERING

400 Aeronautical & Astronautical
410 Agricultural
415 Biomedical
420 Civil
430 Chemical
435 Ceramic
437 Computer
440 Electrical
445 Electronics
450 Industrial & Manufacturing
455 Nuclear
460 Engineering Mechanics
465 Engineering Physics
470 Mechanical
475 Metallurgy & Phys. Met. Engr.
476 Systems Design & Systems Science (see also 072, 073, 074)
478 Operations Research (see also 082)
479 Fuel Technology & Petrol. Engr. (see also 395)
480 Sanitary & Environmental
486 Mining
497 Materials Science
498 Engineering, General
499 Engineering, Other*

AGRICULTURAL SCIENCES

500 Agronomy
501 Agricultural Economics
502 Animal Husbandry
503 Food Science and/or Technology (see also 573)
504 Fish & Wildlife
505 Forestry
506 Horticulture
509 Soils & Soil Science
510 Animal Science & Animal Nutrition
511 Phytopathology
518 Agriculture, General
519 Agriculture, Other*

MEDICAL SCIENCES

520 Medicine & Surgery
522 Public Health & Epidemiology
523 Veterinary Medicine
524 Hospital Administration
526 Nursing
527 Parasitology
528 Environmental Health
534 Pathology
536 Pharmacology
537 Pharmacy
538 Medical Sciences, General
539 Medical Sciences, Other*

BIOLOGICAL SCIENCES

540 Biochemistry (see also 280)
542 Biophysics
543 Biomathematics
544 Biometrics and Biostatistics (see also 055, 670, 725, 727)
545 Anatomy
546 Cytology
547 Embryology
548 Immunology
550 Botany
560 Ecology
562 Hydrobiology
564 Microbiology & Bacteriology
566 Physiology, Animal
567 Physiology, Plant
569 Zoology
570 Genetics
571 Entomology
572 Molecular Biology
573 Food Science and/or Technology (see also 503)
574 Behavioral Biology
576 Nutrition & Dietetics
578 Biological Sciences, General
579 Biological Sciences, Other*

PSYCHOLOGY

600 Clinical
610 Counseling & Guidance
620 Developmental & Gerontological
630 Educational
635 School Psychology
641 Experimental
642 Comparative
643 Physiological
650 Industrial & Personnel
660 Personality
670 Psychometrics (see also 055, 544, 725, 727)
680 Social
698 Psychology, General
699 Psychology, Other*

SOCIAL SCIENCES

700 Anthropology
703 Archeology
708 Communications*
709 Linguistics
710 Sociology
720 Economics (see also 501)
725 Econometrics (see also 055, 544, 670, 727)
727 Social Statistics (see also 055, 544, 670, 725)
740 Geography
745 Area Studies*
751 Political Science
752 Public Administration
755 International Relations
760 Criminology & Criminal Justice
770 Urban & Regional Planning
775 History & Philosophy of Science
798 Social Sciences, General
799 Social Sciences, Other*

HUMANITIES

802 History & Criticism of Art
804 History, American
805 History, European
806 History, Other*
808 American Studies
809 Theater & Theater Criticism
830 Music
831 Speech as a Dramatic Art (see also 885)
834 Philosophy
836 Comparative Literature
881 Library & Archival Sciences
878 Humanities, General
879 Humanities, Other*

LANGUAGES & LITERATURE

811 American
812 English
821 German
822 Russian
823 French
824 Spanish & Portuguese
826 Italian
827 Classical*
829 Other Languages*

EDUCATION & OTHER PROFESSIONAL FIELDS

801 Art, Applied
833 Religion
881 Theology
882 Business Administration
883 Home Economics
884 Journalism
885 Speech & Hearing Sciences (see also 831)
896 Law, Jurisprudence
887 Social Work
897 Professional Field, Other*
938 Education (other than teaching in a field listed above)
999 Other Fields*

*Identify the specific field in the space on the questionnaire.

LIST OF FEDERAL SUPPORTING AGENCIES (For use with #14)

1 Agency for International Development
2 Environmental Protection Agency
3 National Aeronautics & Space Administration
4 National Endowment for the Arts
5 National Endowment for the Humanities
6 National Science Foundation
7 Nuclear Regulatory Commission
8 Smithsonian Institution
9 Department of Agriculture
10 Department of Commerce
11 Department of Defense
12 Department of Energy
13 National Institutes of Health (DHHS)
14 Alcohol, Drug Abuse & Mental Health Administration (NIAA, NIDA, NIMH)
15 Other DHHS, specify_____
16 National Institute of Education (E.D.)
17 Other Department of Education (E.D.)
18 Department of Housing and Urban Development
19 Department of the Interior
20 Department of Justice
21 Department of Labor
22 Department of State
23 Department of Transportation
24 Other agency or department, specify_____
25 Don't know source agency

OMI

1981 SURVEY OF DOCTORATE RECIPIENTS

ABBREVIATED QUESTIONNAIRE

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION, THE NATIONAL ENDOWMENT FOR THE HUMANITIES, THE NATIONAL INSTITUTES OF HEALTH AND THE DEPARTMENT OF ENERGY

If your name and address are incorrect, please enter correct information below.

_____

_____

_____

Listed below are responses that you provided to us in previous surveys. Please check the preprinted information to determine if it accurately reports your employment data as of FEBRUARY 1981. If the data are correct, please write NC in the change column. If the data are no longer correct, please enter the corrected information in the spaces provided.

	Previous Survey Response	Changes as of FEBRUARY 1981
Date of Birth.....		_____
Major Field of Doctorate.....		_____
Institution/Year of Doctorate.		_____
Employment Status.....		_____
Employment Specialty.....		_____
Type of Employer.....		_____
Primary Work Activity.....		_____
Academic Rank.....		_____
Tenure Status.....		_____

Please give the name of your principal employer (company, organization, postdoctoral institution, etc., or, if self employed, write "self") and actual place of employment during FEBRUARY 1981.

_____
Name of Employer

_____
Number Street

_____
City State ZIP code

What was the basic annual salary associated with your principal professional employment during FEBRUARY 1981? If you were on a postdoctoral appointment, what was your stipend plus allowances?

$_____ per year

Check whether salary was for ___9-10 months

___11-12 months

Thank you for completing this questionnaire. Please return the completed form in the enclosed envelope to the Commission on Human Resources, JH638, National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418.

NOTE: This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential, will be safeguarded in accordance with the provisions of the Privacy Act of 1974, and will be used for statistical purposes only. Information will be released only in the form of statistical summaries or in a form which does not identify information about any particular person. Your response is entirely voluntary and your failure to provide some or all of the requested information will in no way adversely affect you.

APPENDIX B

SAMPLING FRAME

Data from the Survey of Doctorate Recipients (SDR) are collected biennially from a stratified random sample of Ph.D. scientists, engineers, and humanists. A longitudinal data base has been constructed from the five surveys conducted since 1973. For each survey, adjustments have been made to both the sampling frame and the sample. These revisions have significant implications when comparing the results of one survey to the results of another.

1973

In 1973 a sample of approximately 59,100 was randomly selected from a sampling frame (population) of 261,400 individuals who either earned doctorates in science and engineering between January 1, 1930, and June 30, 1972, or earned nonscience/nonengineering Ph.D.s in the same period but were identified as being employed in a science or engineering position. The sample was stratified by year of doctorate, field of doctorate or employment, sex, size of Ph.D. institution (in terms of the number of Ph.D. degrees granted), and degree category (i.e., science and engineering Ph.D.s from U.S. institutions--segment 1; nonscience Ph.D.s from U.S. institutions for individuals who subsequently switched to a science employment field--segment 2; and holders of doctorates from foreign institutions who were employed in the United States--segment 3).

The sampling frame for segment 1 was the NRC's Doctorate Records File (DRF), which lists nearly all Ph.D.s awarded from U.S. universities from 1920 to the present, based on the annual Survey of Earned Doctorates (SED). Segment 2 cases were drawn from NSF's National Register of Scientific and Technical Personnel (1970). Segment 3 cases were selected from college catalogs, professional directories, and rosters of employees obtained from several large U.S. business/industrial firms.

1975

Individuals who earned their Ph.D.s in science/engineering between July 1, 1972, and June 30, 1974, were added to segment 1 of the SDR roster prior to the 1975 survey. A random, stratified sample of these Ph.D.s was added to the 1975 survey sample, and 1930-1931 Ph.D.s were deleted from the sample, leaving a sample of approximately 62,470 Ph.D s.

A revision in the stratification criteria resulted in the deletion of size of Ph.D. institution as a stratifying variable and the addition of racial/ethnic classification. The source of data for the racial/ethnic variable was the DRF. However, because data on racial/ethnic identification was not collected until 1973, a large portion of the sample could not be classified.

1977

The cohort adjustments were again made to maintain a 42-year time span (January 1, 1934, to June 30, 1976) for scientists and engineers.

Individuals who indicated in the Survey of Earned Doctorates that they were foreign citizens and planned to depart the United States following receipt of their doctorates were deleted from the 1977 sampling frame on the assumption of a high probability that they would remain outside the U.S. labor force.

Humanities Ph.D. recipients who earned their degrees between January 1, 1930, and June 30, 1976, were added to segment 1 of the sampling frame in 1977. A stratified random sample of those Ph.D.s was added to the survey sample. In view of the fact that the 1930-1933 humanities Ph.D.s were not included as part of the 1973 and 1975 surveys, these Ph.D.s were included in the 1977 survey. Ph.D.s in the humanities were deleted from segment 2, leaving only doctorate recipients in education and other professional fields in segment 2. The 1977 survey sample was approximately 83,550.

1979

The 1979 sampling frame was adjusted to include only Ph.D. recipients who had earned their degrees between January 1, 1936, and June 30, 1978.

In the nonresponse bias study of the 1975 Survey of Doctorate Recipients, it was discovered that the survey nonrespondents consisted of higher percentages of foreign citizens and foreign residents. To adjust for this bias, citizenship was added as a stratification variable. The 1979 sample consisted of approximately 51,710 Ph.D.s, an overall sampling rate of 11.8 percent.

1981

For the 1981 Survey, the cohort adjustments were again made to maintain a 42-year time span (January 1, 1938, to June 30, 1980, Ph.D.s). In addition, the overall sampling rate for FY1973-1976 Ph.D.s was increased from 11.9 percent to 15 percent on a one-time basis in 1981, to provide sufficient responses for a special SDR report on recent doctorate recipients that was planned for 1982. The 1981 sampling frame also included individuals who earned their doctoral degrees between July 1980 and February 1981; the population of these 8-months of Ph.D.s, however, was incomplete at the time the sample was selected. The 1981 sample was 65,391 Ph.D.s, an overall sampling rate of 13.5 percent.

Sampling Rates and Sample Attrition

For the 1973, 1975, and 1977 surveys, the sample rate averaged an overall 21 percent. In 1979, the longitudinal sample was reduced in size because of budgetary constraints. The revised sample, using a sampling rate of 11.8 percent, was reviewed to assure that the survey sample was large enough to provide reliable estimates of the Ph.D. population. For the 1981 survey, the sample of FY1973-1976 Ph.D.s was increased, resulting in an overall sampling rate of 13.5 percent.

A total of 101,518 individuals have been members of at least one of the five SDR samples. Of these 29,091, or 28.7 percent, have been included in all five samples; 78,102 have responded to at least one of the surveys, and 11,923 have responded to all five surveys.

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